

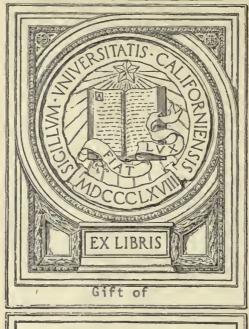
# THE REGIONS OF THE HUMAN BODY OSTEOLOGY

## ARTHROLOGY



TOLDT

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### AN ATLAS

OF

## HUMAN ANATOMY

FOR STUDENTS AND PHYSICIANS

BY

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ASSISTED BY

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Adapted to English and American and International Terminology

BY

M. EDEN PAUL, M.D. BRUX., M.R.C.S., L.R.C.P.

#### FIRST SECTION

A. THE REGIONS OF THE HUMAN BODY B. OSTEOLOGY

(FIGURES I TO 377 AND INDEX)

REVISED EDITION



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#### TRANSLATOR'S PREFACE

THE science of human anatomy is purely descriptive in its methods, the field it covers is not very extensive, and its boundaries are sharply limited; it is, therefore, one of the few sciences in which something closely verging on finality and completeness has been attained. Even, however, if no new anatomical data are likely to be forthcoming, there is yet scope for originality in the method of presentation of those data of which the science now consists; and originality of this kind Professor Toldt's "Atlas of Human Anatomy" exhibits in a high degree. In the many admirable manuals of human anatomy now extant in English, the illustrations, even when numerous, as they are often, and when good, as they are occasionally, form a mere supplement—usually a very imperfect supplement—to the text. Atlases of anatomy, and useful atlases, also exist in English, but all are quite fragmentary. Some, like the well-known and valuable, but somewhat antiquated, "Illustrations of Dissections," consist of a series of pictures of selected regions carefully prepared on the cadaver: these are models for the imitation of the student in his own dissecting work, but are not of much value for private study. Others, like Bellamy's English edition of Braune's atlas of frozen sections of the human body, present a small number of anatomical facts from a striking and unfamiliar point of view. But among English works, an accurate pictorial representation of all the data of human anatomy, carefully drawn to scale from actual specimens, and arranged suitably for systematic study, has hitherto been lacking.

Whilst a true knowledge of anatomy, a knowledge that will through life supply the needs of the physician and the surgeon in their practical work, can be obtained only in the dissecting-room, the student's labours with scalpel and forceps must be preceded and supplemented by systematic private study. Now, for this purpose, the textual descriptive treatise is not alone sufficient; or, if sufficient, it is so at an excessive expenditure of time and labour. Both in his work preparatory to dissection and in his revision of his anatomical knowledge subsequent to dissection, the energy of the student will be enormously economized if he has at hand a graphic representation of every structure named and described in his systematic treatise. An increased use of the visual or graphic method, both in the acquirement and in the revivification of knowledge, is a feature of the age in all educational departments; but this English translation of Professor Toldt's work is, as far as the English-speaking races are concerned, the first adequate application of the method to the study of human anatomy.

In speaking of the finality and completeness of anatomical science, one exception must be made, and this exception relates to anatomical terminology, which, though nearly completed, has not yet attained finality. Had there been a universal anatomical nomenclature—a nomenclature, that is, adopted by, or even fully intelligible to, anatomists of all nationalities—an English edition of this work would have been superfluous. Anatomy, however, like all other sciences, has suffered from the dispersion of tongues that ensued on the Renascence, when the good and the evil of mediævalism became inextricably confounded, and were cast away together, and the inestimable gift of a language common to the learned of all lands was lost for ever. The German-speaking peoples have a fairly complete and fairly pure Latin anatomical nomenclature, needing, however, to be eked out here and there by the vernacular; whilst in England, as in France, a strange and bastard dialect, half Latin and half vernacular, has come into use. Uncouth jargon as it is, being current and familiar, it is not likely in England and America ever to be replaced by the more consistent terminology in use in the anatomical schools of Germany and Austria; I have, however, in this English edition of the "Atlas of Anatomy" retained the terminology of the original side by side with the English translation, distinguishing between the two by a difference of type.

In some cases, in the nomenclature used by the author, terms are met with which have no counterpart in English anatomical terminology: either because the author regards as normal a structure which English anatomists regard as a variety; or, and far more commonly, because the structure in question, though normal, is unimportant, and English anatomists have therefore neglected to name it. Sometimes, in such cases, I have given a literal English translation of the Latin name used by the author; sometimes, however, a periphrasis has been required to explain what the structure is, or to account for the absence of an English name, and this periphrasis, when lengthy, has been printed as a foot-note. In all such cases, an asterisk is prefixed both to the Latin name and to its English equivalent, to indicate to the reader that there is something unusual in the terms employed.

I must further point out that in a few instances the author's nomenclature actually conflicts with that commonly used in England, so that the literal translation of the author's name for a certain structure is applied in England to a structure totally different. For instance, what the author calls canalis pterygopalatinus is in England called the posterior palatine or palatomaxillary canal, while the pterygopalatine canal of English anatomists is called by the author canalis pharyngeus. But for this warning, beginners might imagine such divergencies to be due to carelessness on the part of the translator or to errors of the press.

A further difficulty has arisen from the fact that English anatomical nomenclature is itself not yet finally settled, nor even wholly consistent. Not merely is the same structure often known by several names; but, which is worse, the same

#### TRANSLATOR'S PREFACE

name is sometimes applied to two different structures. Reform is therefore needed, but it is not the part of a translator to undertake it, and I have perforce been content to follow the authorities. My leading authority has been the tenth edition of Quain's "Elements of Anatomy," but I have also had Macalister's "Text-book of Human Anatomy" in constant requisition. From these works I have, when more than one name is used to denote any structure, taken all those in common use, the order in which the alternative names have been printed showing most often the relative frequency of employment; in a few cases, however, where a name less commonly used has appeared to me distinctly preferable for any reason to an alternative name more commonly used, I have given the less usual but preferable name the precedence. To this small extent only have I been influenced by my own views in the matter of anatomical terminology; and, with the exception of those names which for the reason already furnished are preceded by an asterisk, all the terms in the English nomenclature are in use by one or more of the leading English authorities.

As regards the terminology employed in the United States of America, the contributions of the scientific investigators of that country to anatomy have, owing to the early perfection of this branch of study, been far less extensive than in the case of the other sciences ancillary to medicine; and the science of anatomy was for the most part taken bodily over, text-books, terminology, and all complete. A few differences, however, exist, and I have therefore collated my manuscript with that useful little work, Young's "Synopsis of Human Anatomy," and any divergent terms in use in America only have been inserted in my translation, and distinguished by the addition of the letters "U.S."

A considerable number of the references to the figures will be found to be in the English nomenclature only. These are either cases in which the English and the International descriptive terms were identical, and the printing of both was therefore superfluous; or else cases in which in the original the reference was wholly in German.

Measurements given in the original in centimetres have in all cases been reduced to inches. In illustrations of fœtal parts the age of the fœtus is given in months from the date of fertilization of the ovum. On the Continent, however, the period of utero-gestation is usually reckoned as ten "months" of four weeks each; not, as with us, as nine calendar months. To avoid mistake, I have in all such cases after the word "month" or "months" added in parentheses the words "months of four weeks each."

I cannot dismiss mention of the works of reference I have employed without alluding to the German-English "Dictionary of Medical Terms," by Treves and Lang—a book invaluable to all those engaged in the translation of German medical works.

Since this Atlas is intended for the use of beginners, as well as for that of advanced students of human anatomy and of practitioners of medicine, I may fitly conclude this preface with a few words on the general principles of anatomical nomenclature. For descriptive purposes the body is regarded as being in the upright posture, with the arms extended by the sides, and the hands fully supinated, so that the palms look forward. With this attitude kept in mind, the meaning of the terms superior and inferior, anterior and posterior, external and internal, is obvious. Sometimes, however, descriptive terms of another kind are used, to remove the confusion liable to arise from the adoption by man of an attitude different from that of all the other vertebrata, and to homolog ze the nomenclature of human with that of comparative anatomy. Thus, cephalic and caudal in comparative anatomy correspond respectively with superior and inferior in human anatomy; ventral and dorsal, with anterior and posterior. Dividing the body into right and left halves by a vertical median plane, which cuts the surface of the body at the median line, medial or mesial and lateral correspond respectively with internal and external in denoting position respectively nearer to, or more remote from, the median pla e. Other terms in frequent use are superficial and deep, central and peripheral, proximal and distal; these are self-explanatory.

In some cases descriptive terms applied to portions of certain structures denote the relation of these portions to other structures, as when we speak of the vertebral and the sternal extremities of the ribs, or the acromial and the sternal extremities of the clavicle. Terms of similar import are radial and ulnar applied to structures of the forearm; tibial and fibular (or peroneal) of the leg; palmar and dorsal of the hand; plantar and dorsal of the foot; flexor and extensor of any of the extr. mities. It is to be noted that internal and external are sometimes used in a sense different from that previously explained, being employed to denote the interior and exterior positions respectively, either in relation to the general axis of the body or to the axis of one of its cavities. In this sense, for instance, we may speak of the internal and the external tables of the cranial vault, or of the internal and the external oblique muscles of the abdomen; but it is, as a rule, better to use the words inner and outer to denote this relation, and to reserve internal and external for position in r spect to the median plane.

Finally we have to explain the terms used to denote certain directions, more e-pecially the direction of certain sections: these are *horizontal* and *vertical*, requiring no definition; *sagittal*, denoting a dorso-ventral direction either in or parallel to the median plane; and *frontal* or *coronal*, which are synonymous terms, denoting direction in a transverse vertical plane.

The definition of many of the terms used in descriptive anatomy, such as condyle and tuberosity, process and tubercle, sinus and cavity, ligament, tendon, and aponeurosis, would be superfluous, since the student will best gain an accurate notion of their meaning by an examination of the structures to which they are respectively applied.

M. EDEN PAUL.

## REGIONES CORPORIS HUMANI

THE REGIONS
OF THE HUMAN BODY

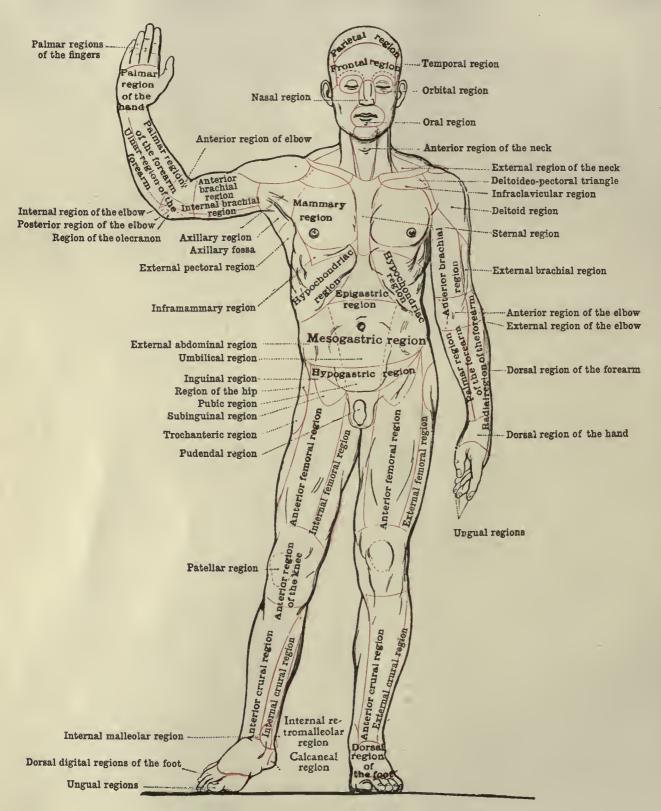


FIG. 1.—ANTERIOR SURFACE OF THE BODY.

Regions of the Human Body.

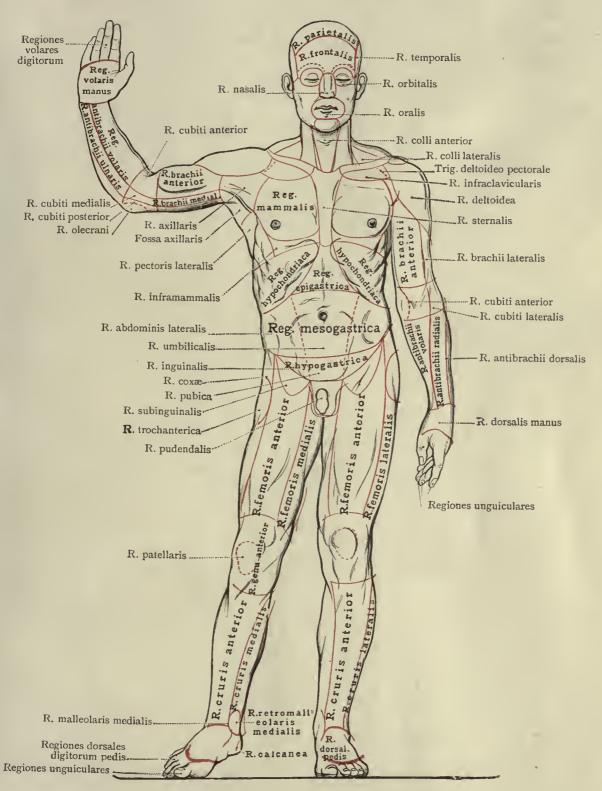


FIG. 1a.—ANTERIOR SURFACE OF THE BODY.

Regiones Corporis Humani.

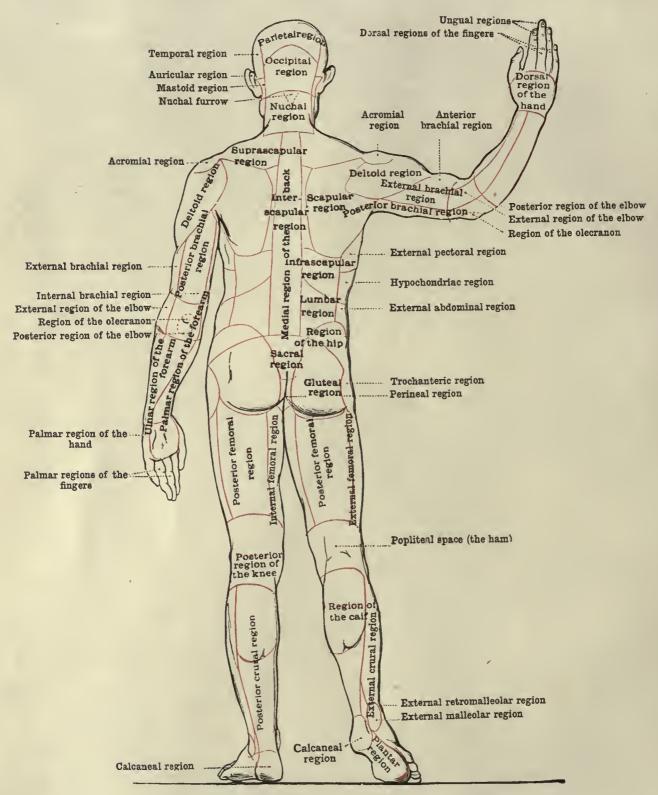


Fig. 2.—Posterior Surface of the Body.

Regions of the Human Body.

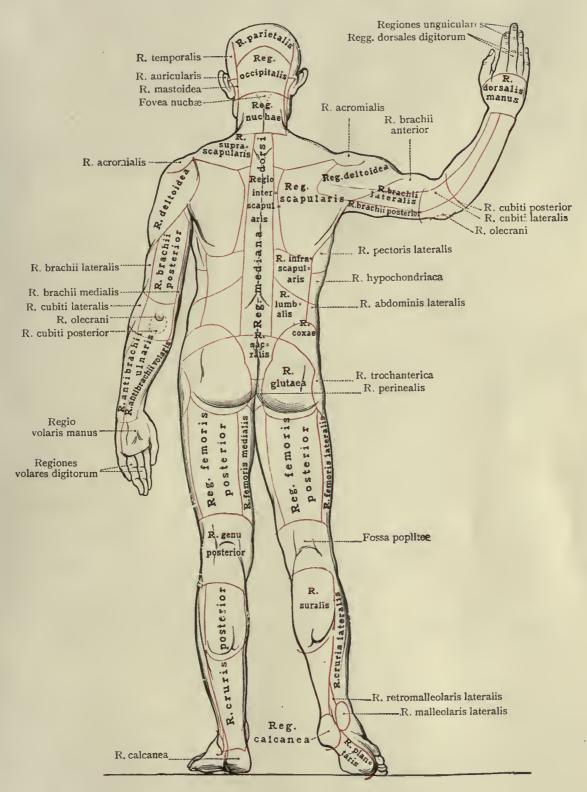


FIG. 2a.—POSTERIOR SURFACE OF THE BODY.

Regiones Corporis Humani.

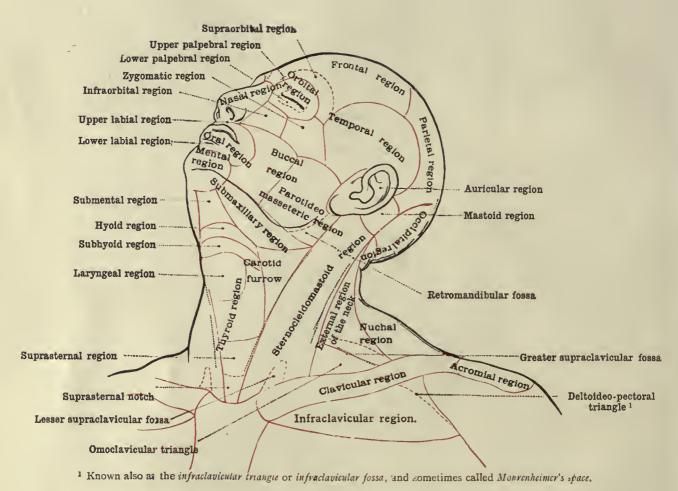
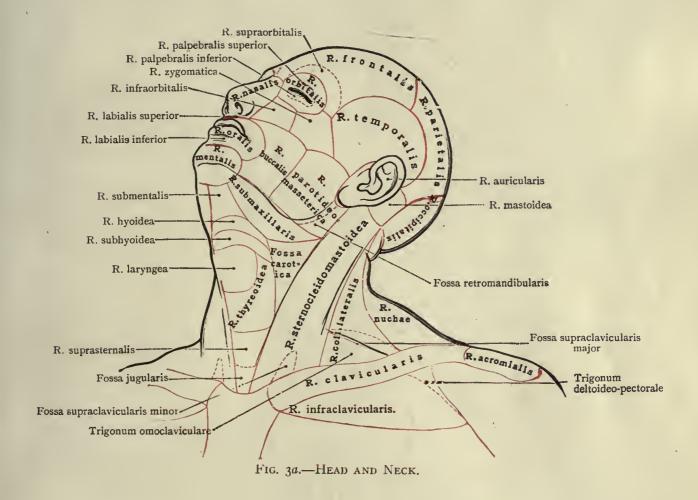


Fig. 3.—Head and Neck.

Regions of the Head and Neck.



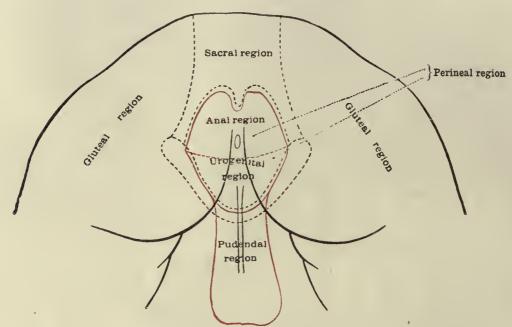


Fig. 4.—Male Perineal Region.

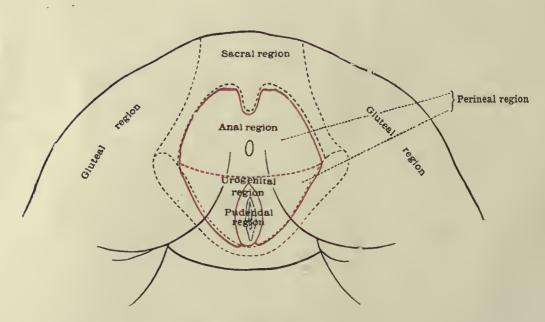


Fig. 5.—Female Perineal Region.

Perineal Region.

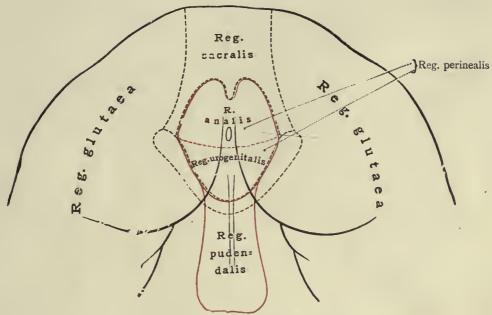


FIG. 4a.—MALE PERINEAL REGION.

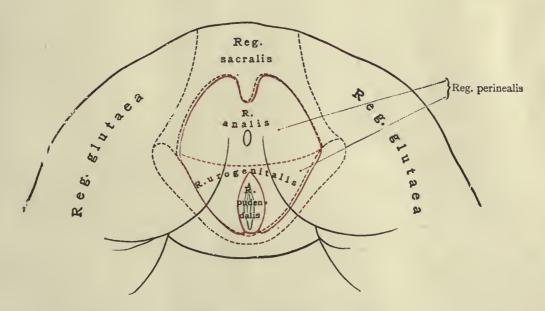
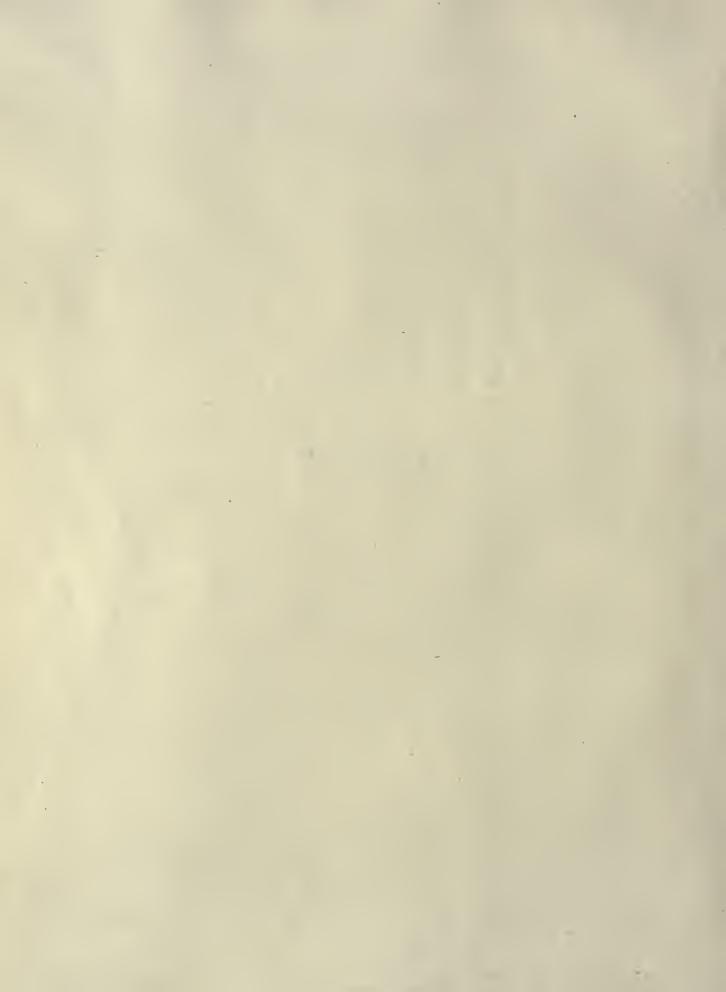


FIG. 5a.—FEMALE PERINEAL REGION.

Regio Perinealis.



## OSTEOLOGIA OSTEOLOGY



THE STRUCTURE OF THE BONES

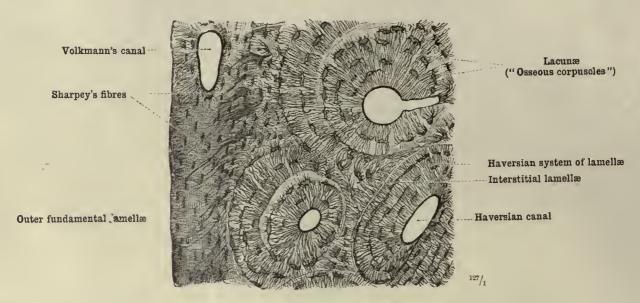


Fig. 6.—Portion of a Cross-Section through the Compact Tissue of a Long Bone.

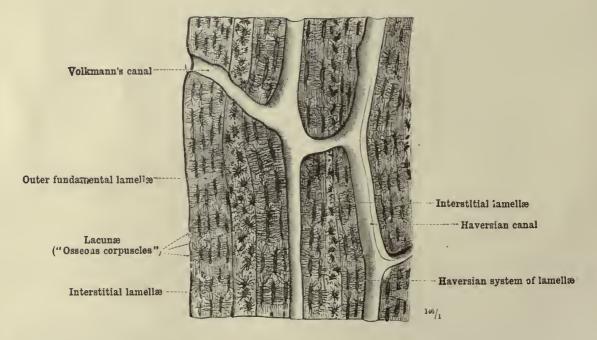


Fig. 7.—Portion of a Longitudinal Section through the Compact Tissue of a Long Bone.

Microscopical Structure of Bone.

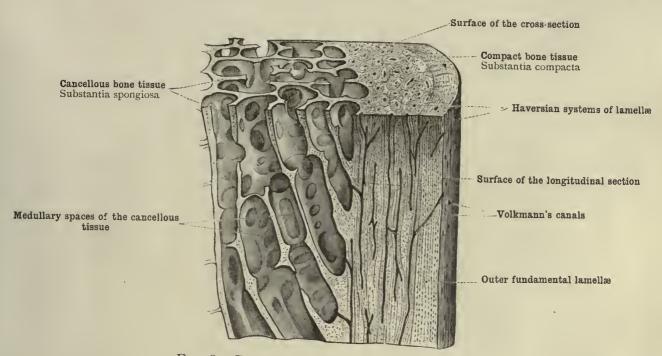


FIG. 8.—DIAGRAM OF THE STRUCTURE OF BONE.

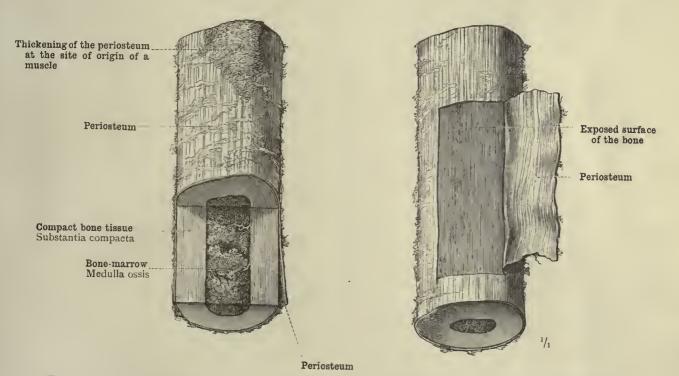


Fig. 9.—Part of the Middle Segment of the Femur from which the Periosteum has been partially removed.

The medullary canal (cavum medullare) has been opened, and the bone-marrow (medulla ossis) is seen.

Periosteum and Bone-Marrow (Medulla Ossium).

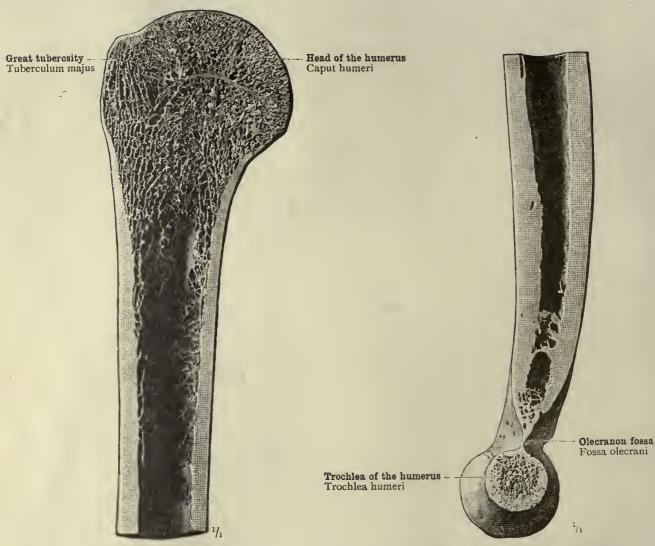


Fig. 10.—Proximal Portion in Frontal Section.

Fig. 11.—Distal Portion in Sagittal Section.

Humerus—Arm-bone: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa longa-Long bones.

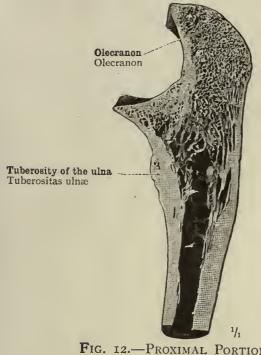


FIG. 12.—PROXIMAL PORTION IN SAGITTAL SECTION.

Head Capitulum FIG. 13.—DISTAL PORTION IN

Styloid process Processus styloideus

Ulna.



Fig. 14.—Proximal Portion.

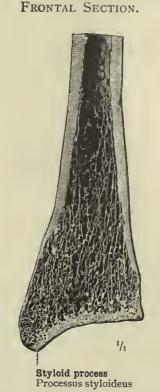


FIG. 15.—DISTAL PORTION.

Radius.

Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones. Ossa longa-Long bones.

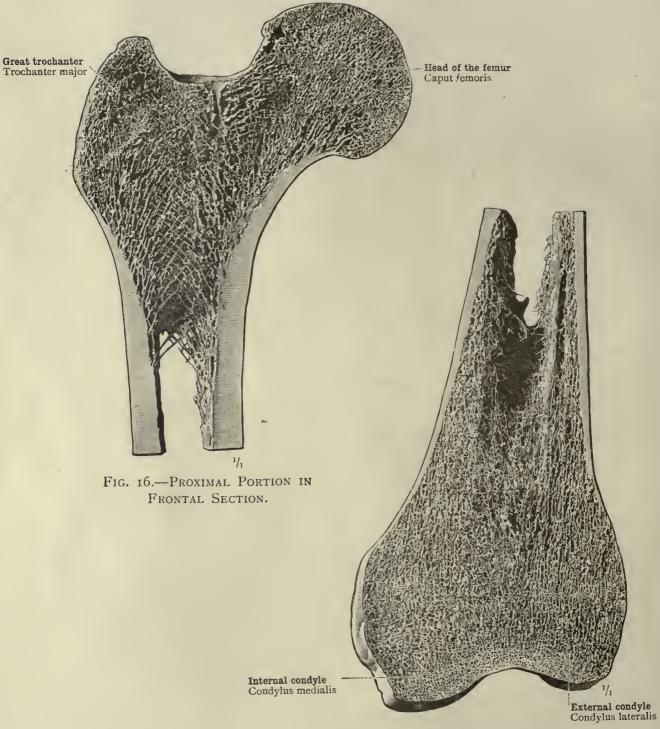
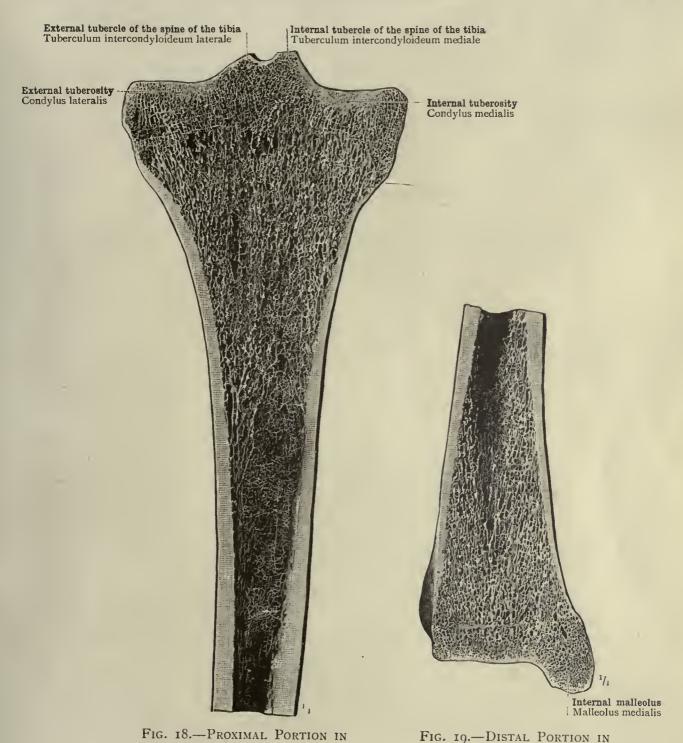


Fig. 17.—Distal Portion in Frontal Section.

Femur—Thigh-bone: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa longa-Long bones.



Tibia—Shin-bone: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

FRONTAL SECTION.

FRONTAL SECTION.

Ossa longa-Long bones.



FIG. 20.—THIRD LUMBAR VERTEBRA IN HORIZONTAL SECTION.



FIG. 22.—BODY OF THE SECOND LUMBAR VERTEBRA IN FRONTAL SECTION.

Vertebræ: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa brevia-Short bones.





Anterior surface Facies anterior

SAGITTAL SECTION.

Fig. 23.—Os Cuneiforme III.. THE EXTERNAL CUNEIFORM BONE.

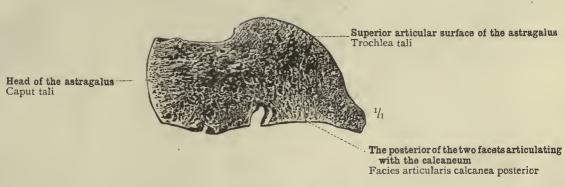


Fig. 24.—Talus, the Astragalus, in Sagittal Section.

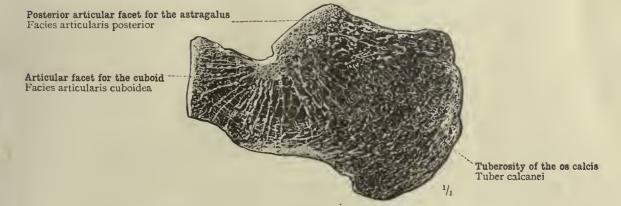


Fig. 25.—Calcaneum, the Os Calcis, in Sagittal Section.

Ossa tarsi—Tarsal bones: Substantia compacta et substantia spongiosa ossium—Compact and cancellous tissue of the bones.

Ossa brevia-Short bones.

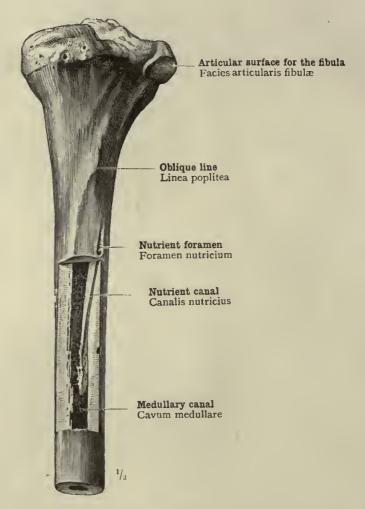


Fig. 26.—Nutrient Foramen and Nutrient Canal of the Right Tibia. Seen from Behind.

By sawing away a portion of the snaft the whole length of the nutrient canal has been opened up.

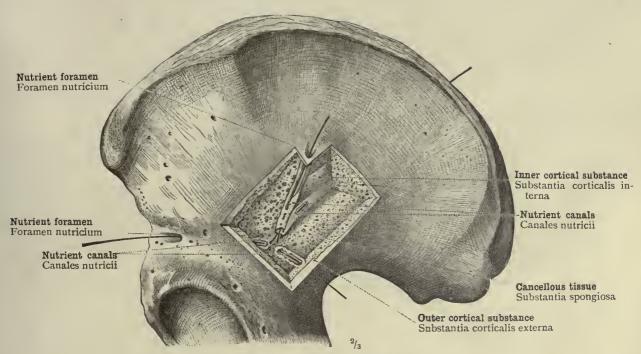


Fig. 27.—Outer Surface of Left Ilium.

By the removal of the outer compact layer and the cancellous tissue of a portion of the bone, the nutrient canals have been displayed. The bristles projecting towards the right above and below show that the nutrient canals into which they have been inserted open on the inner surface of the bone—that turned away from the observer.

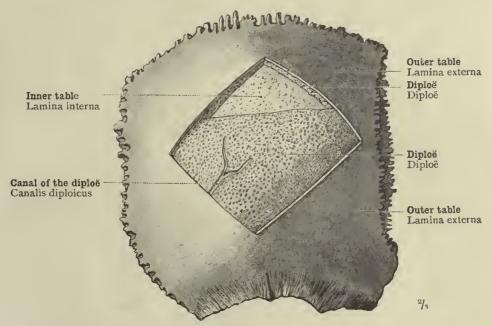
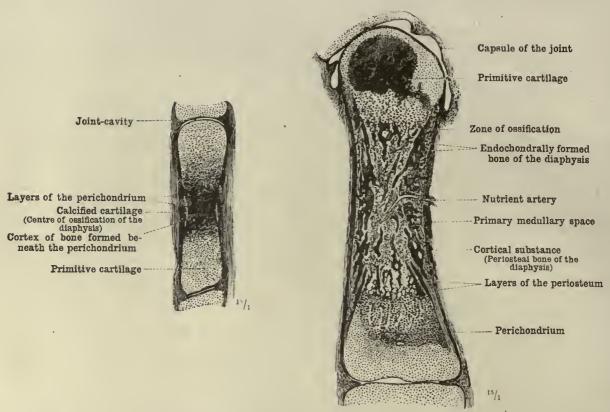


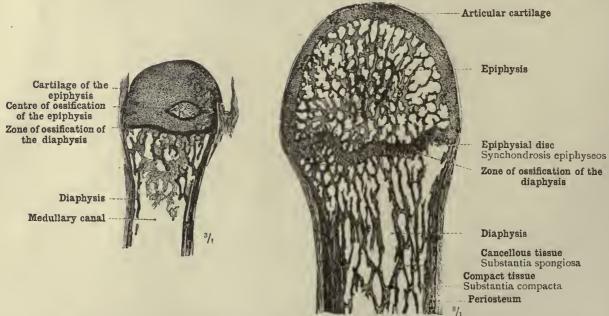
Fig. 28.—Os Parietale, Parietal Bone, prepared to show the Diploë and the Compact Inner Table. Seen from without.

Substantia compacta, substantia spongiosa, et canales nutricii—Compact tissue, cancellous tissue, and nutrient canals.

Ossa plana-Flat bones.



Figs. 29 and 30.—Two Stages in the Intracartilaginous Ossification of Long Bones, as shown by Longitudinal Sections of the Phalanges of a Human Fætus.



Figs. 31 and 32.—Two Stages in the Intracartilaginous Ossification of the Epiphysis of a Long Bone, as shown by Longitudinal Sections of the Distal Portions of Metacarpal Bones.

Development of the Bones.

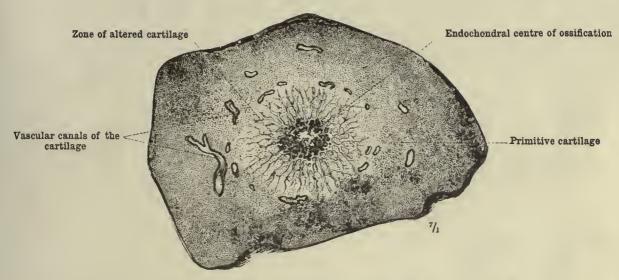


FIG. 33.—INTRACARTILAGINOUS OSSIFICATION OF A SHORT BONE.

A section of the cuboid bone of a new-born child.

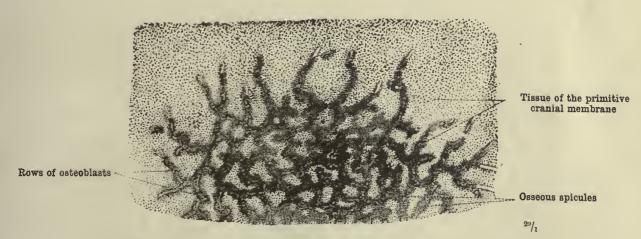


FIG. 34.—Intramembranous Ossification of the Bones of the Cranial Vault.

Upper half of the parietal bone of a human feetus in the eleventh week of intra-uterine life.

Development of the Bones.

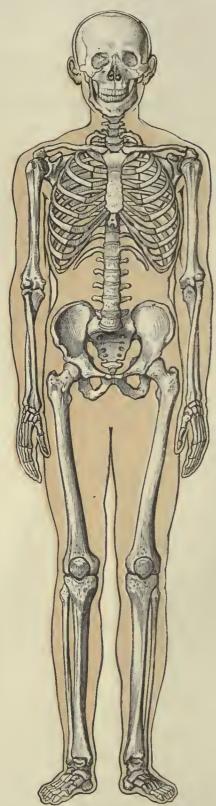


FIG. 35.—ANTERIOR ASPECT.



Fig. 36.—Viewed from the Left Side, the Arm having been removed.

Skeleton humanum—The human skeleton.

## SKELETON TRUNCI THE AXIAL SKELETON

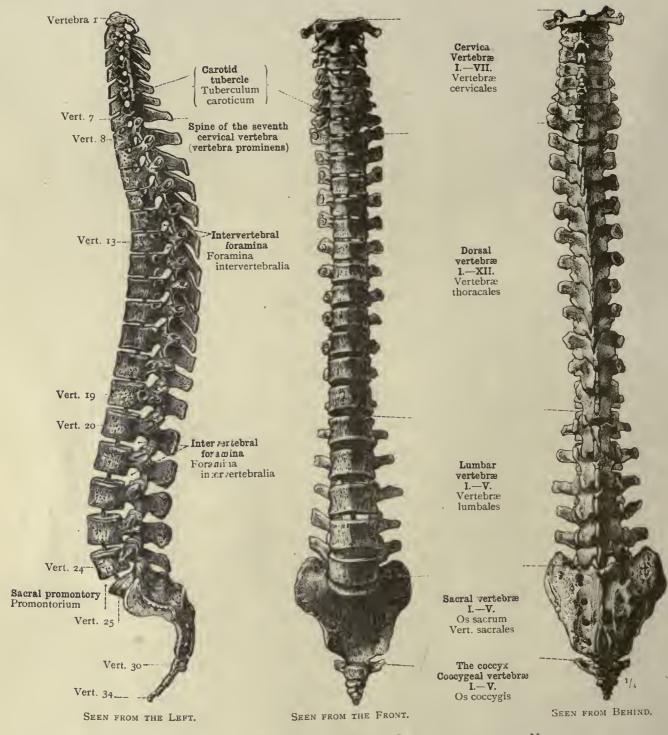


Fig. 37.—The Vertebral Column as a Whole. Classification and Nomenclature of the Vertebræ.

Columna vertebralis-The spinal column.

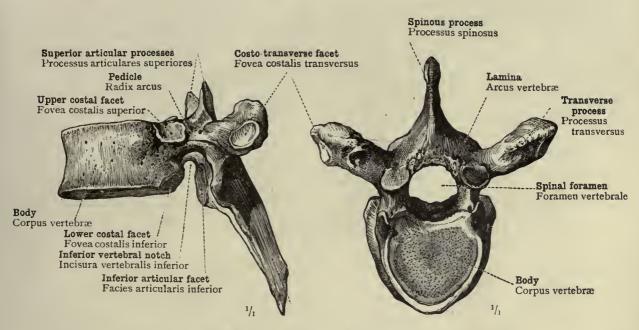
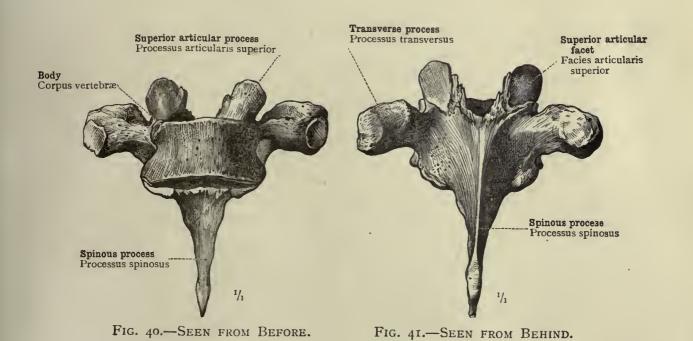


Fig. 38.—Seen from the Left Side.

Fig. 39.—Seen from Above.



Vertebræ: Vertebra thoracalis VI.—Sixth dorsal vertebra.

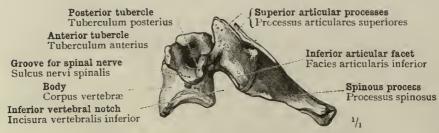
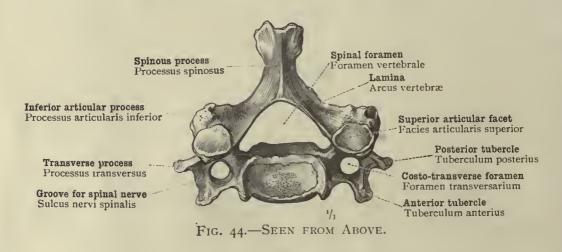


Fig. 42.—Seen from the Left Side.



Fig. 43.—Seen from Before.



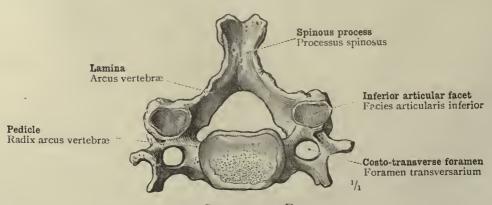


Fig. 45.—Seen from Below.

Vertebræ: Vertebra cervicalis V.-Fifth cervical vertebra.

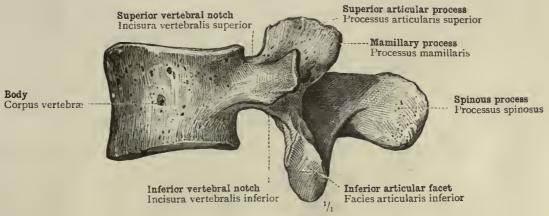


FIG. 46.—SEEN FROM THE LEFT SIDE.

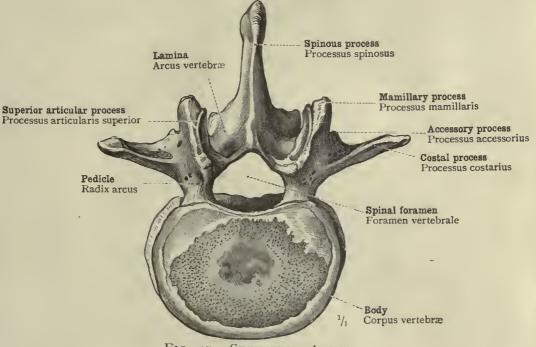


FIG. 47.—SEEN FROM ABOVE.

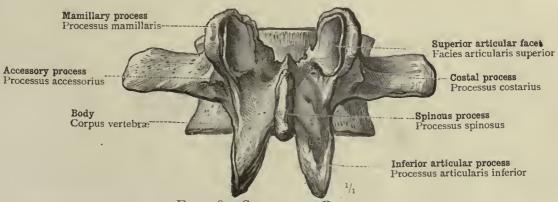


Fig. 48.—Seen from Behind.

Vertebræ: Vertebra lumbalis II.—Second lumbar vertebra.

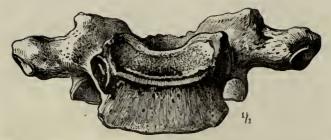


Fig. 49.—Vertebra Thoracalis I.—First Dorsal Vertebra. Seen from Beforb.

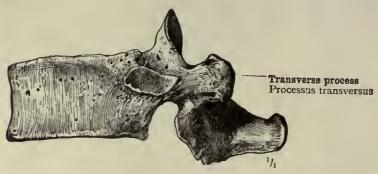


Fig. 50.—Vertebra Thoracalis XI.—Eleventh Dorsal Vertebra. Seen from the Left Side.

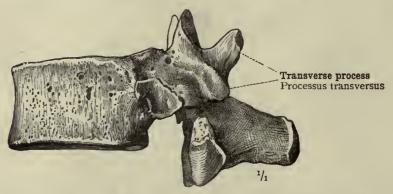


Fig. 51.—Vertebra Thoracalis XII.—Twelfth Dorsal Vertebra. Seen from the Left Side.

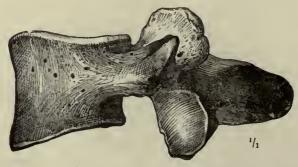


Fig. 52.—Vertebra Lumbalis V.—Fifth Lumbar Vertebra. Seen from the Left Side.

Vertebræ: Transitional forms of the dorsal and lumbar vertebræ.

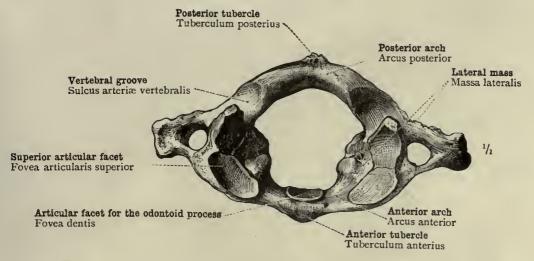


Fig. 53.—The Atlas, or First Cervical Vertebra. Seen from Above.

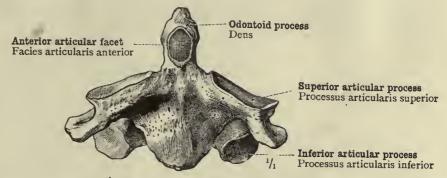


FIG. 54.—EPISTROPHEUS, THE AXIS, OR SECOND CERVICAL VERTEBRA. SEEN FROM BEFORE.

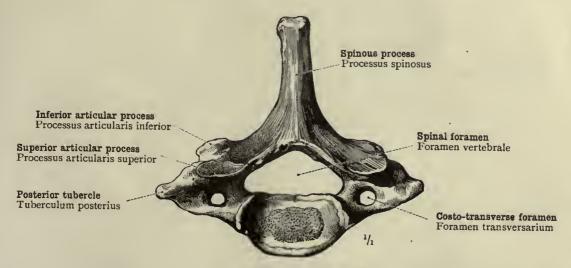


FIG. 55.—VERTEBRA CERVICALIS VII.—SEVENTH CERVICAL VERTEBRA. SEEN FROM ABOVE.

Vertebræ: The atypical cervical vertebræ.

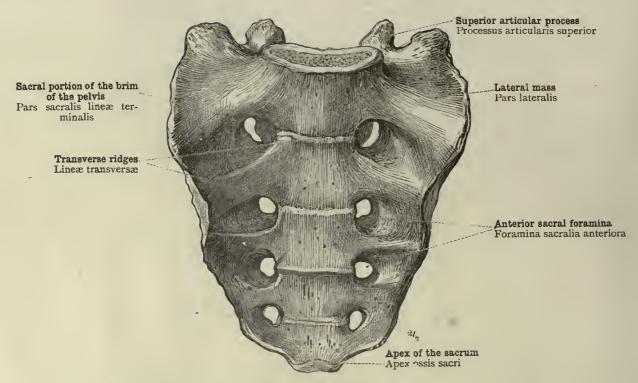


Fig. 56.—Male Sacrum (Facies Pelvina—Pelvic Surface). Seen from Before.

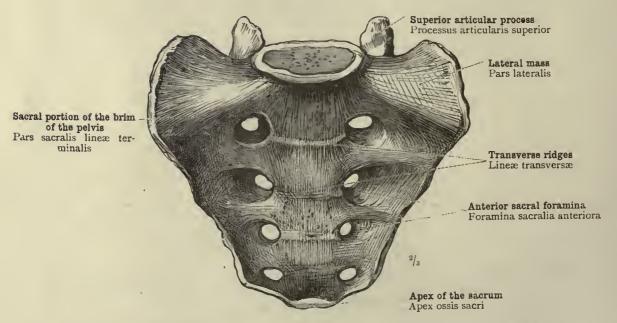


Fig. 57.—Female Sacrum (Facies Pelvina—Pelvic Surface). Seen from Before.

Os sacrum—The sacrum.

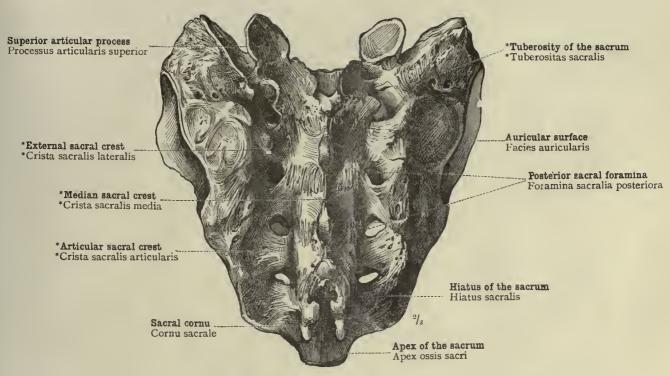


Fig. 58.—Male Sacrum (Facies Dorsalis—Dorsal Surface). Seen from Behind.

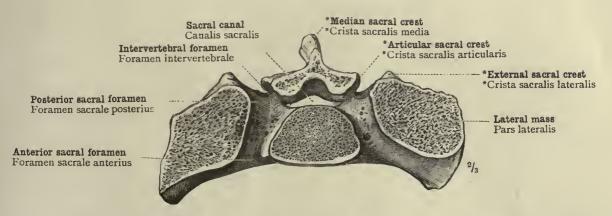


Fig. 59.—Transverse Section through the Sacrum at the Level of the First Set of Sacral Foramina.

Os sacrum-The sacrum.

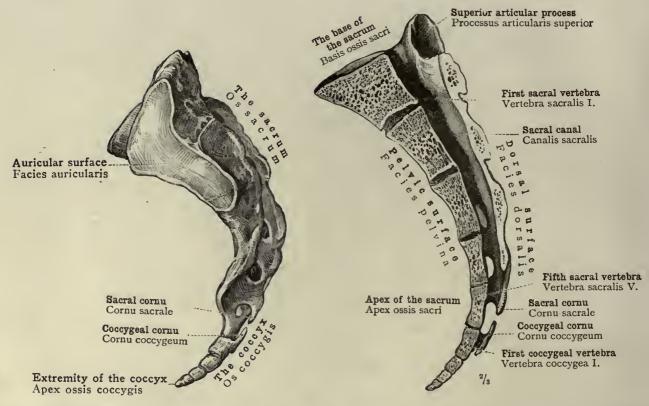


FIG. 60.—SACRUM AND COCCYX. SEEN FROM THE LEFT SIDE.

Fig. 61.—Sacrum and Coccyx in Sagittal Section through the Median Line.



FIG. 62.—COCCYX SEEN FROM BEFORE.



Fig. 63.—Coccyx seen from Behind.

Os sacrum et os coccygis-Sacrum and coccyx.

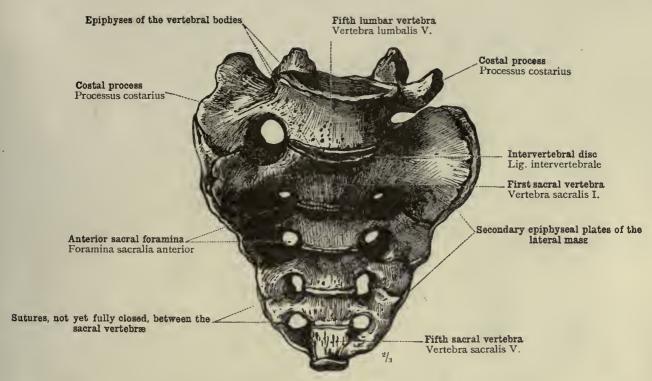


Fig. 64.—Unilateral Assimilation and Commencing Ankylosis of the Fifth Lumbar Vertebra with the Sacrum. Seen from Before.

From a boy seventeen years of age. Epiphyses on the bodies of the sacral vertebra, and along the lateral margins of the sacruin.

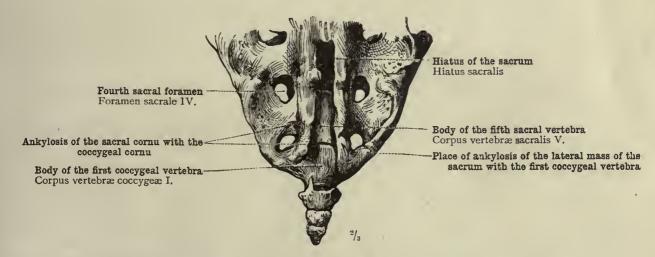
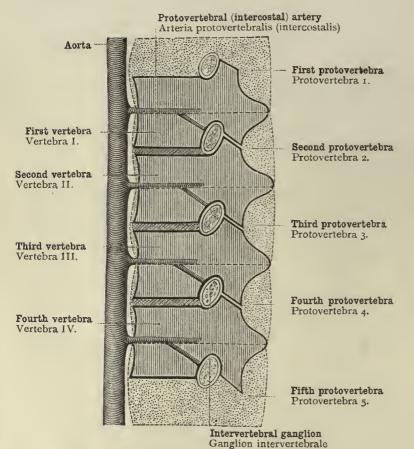


FIG. 65.—ANKYLOSIS OF THE SACRUM WITH THE COCCYX. SEEN FROM BEHIND.

From a man forty years of age.



Intervertebral disc
Ligamentum intervertebrale

Primitive cartilages
of the vertebral
bodies

Notochord
Chorda dorsalis

Fig. 67.—Primitive Cartilages of the Vertebral Bodies.

From a sagittal section through the vertebral column of a human fœtus in the tenth week. (Length of fœtus,  $2\frac{1}{4}$  inches.)

Fig. 66.—Diagram showing the Relations of the Protovertebræ to the Vertebræ. (From von Ebner.)

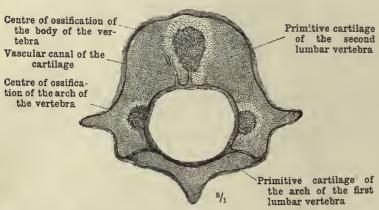


Fig. 69.—The Three Centres of Ossification of a Vertebra.

Horizontal section through the second and a portion of the first lumbar vertebræ of a human fætus in the beginning of the fifth month (months of four weeks each). (Length of fætus, 5½ inches.)

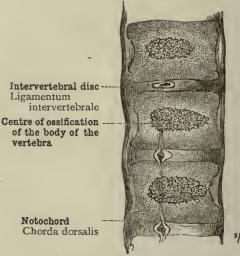


Fig. 68.—Centres of Ossification of the Bodies of the Vertebræ.

From a sagittal section through the vertebral column of a human fœtus in the fourth month (months of four weeks each). (Length of fœtus,  $4\frac{1}{3}$  inches.)

Development of the Vertebræ.

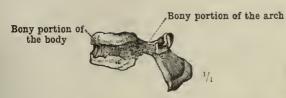


FIG. 70—FIRST LUMBAR VERTEBRA OF A NEW-BORN CHILD.



Fig. 72.—The Seventh Cervical Vertebra OF A New-Born Child.

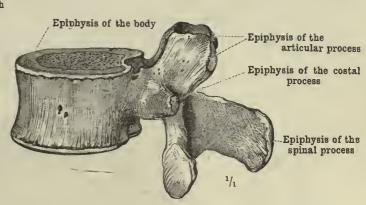


FIG. 71.—FIRST LUMBAR VERTEBRA IN THE EIGHTEENTH YEAR.



FIG. 73.—THE ATLAS AT THE END OF THE FIRST YEAR.



Fig. 74.—The Axis at the End of the First Year.



FIG. 75.—THE ATLAS IN THE FOURTH YEAR.



FIG. 76.—THE AXIS IN THE FOURTH YEAR.

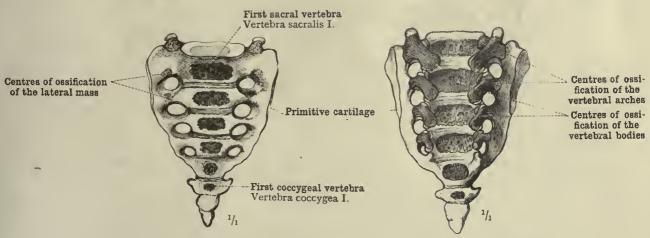
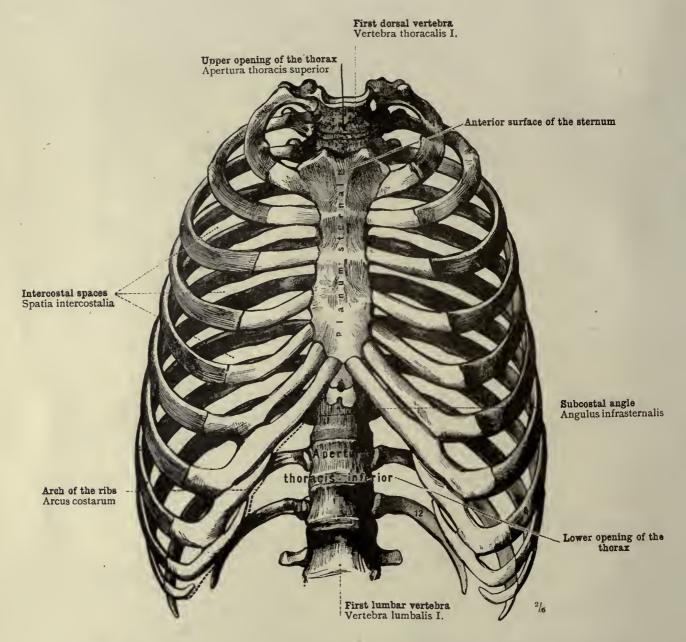


Fig. 77.—Seen from Before.

Fig. 78.—Seen from Behind.

Development of the Vertebræ: The centres of ossification in the sacrum and coccyx of a child at the age of two months.



(1-7, Costæ veræ, sternal or true ribs; 8-12, Costæ spuriæ, asternal or false ribs; 11 and 12, Costæ fluctuantes, floating ribs.)

Fig. 79.—The Thorax seen from Before.

The Thorax.

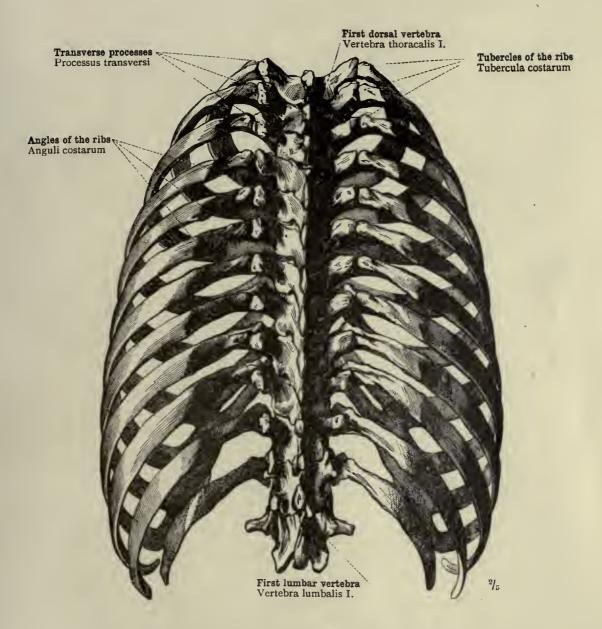


FIG. 80.—THE THORAX SEEN FROM BEHIND.

The Thorax.

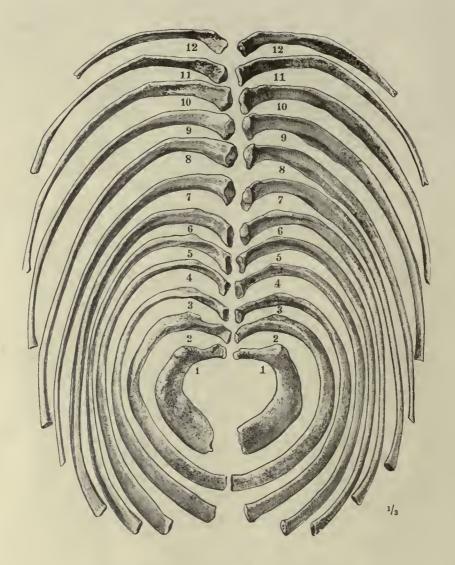


Fig. 81.—The Twelve Pairs of Ribs.

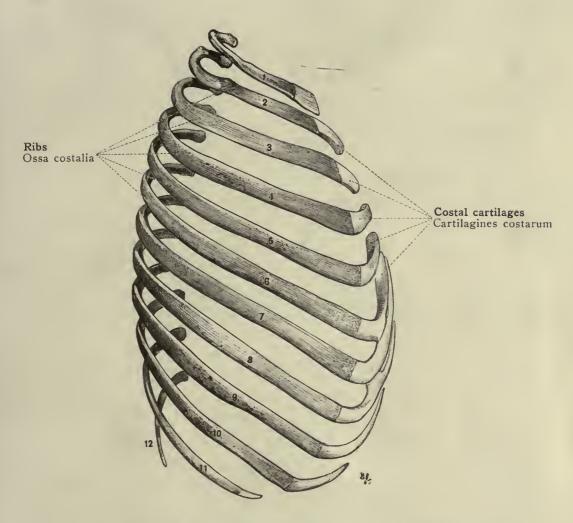


Fig. 82.—The Twelve Ribs of the Right Side in their Natural Position. Seen from the Right.

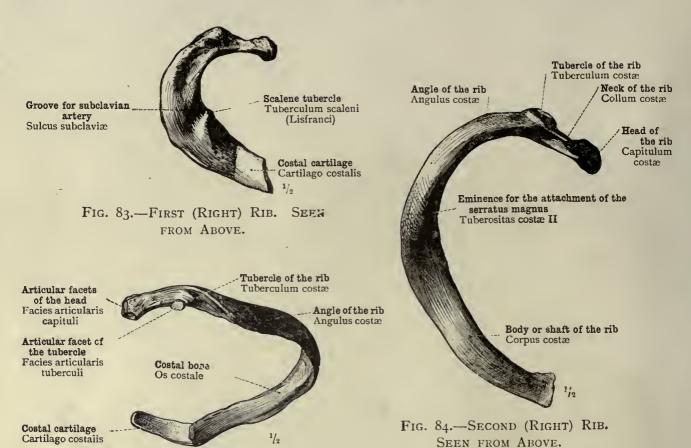
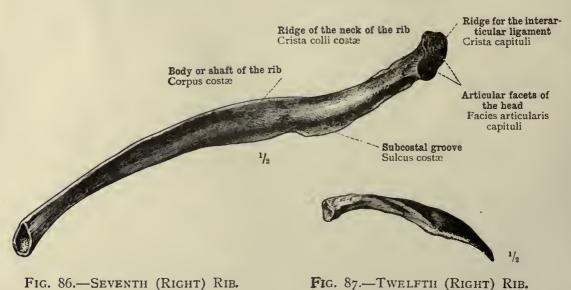


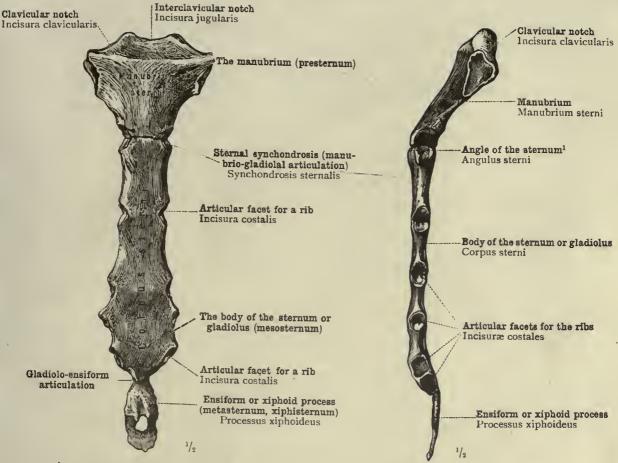
FIG. 85.—FOURTH (RIGHT) RIB. SEEN FROM BEHIND.

SEEN FROM WITHIN.



Costæ-The ribs.

SEEN FROM WITHIN.



In certain pathological conditions the angle between the manubrium and the body of the sternum becomes less obtuse, and therefore more prominent. It is then known as  $angulus\ Ludovici$ , or Ludwig's angle.— $T_R$ .

Fig. 88.—The Sternum seen from Before.

Fig. 89.—The Sternum seen from the Left Side.

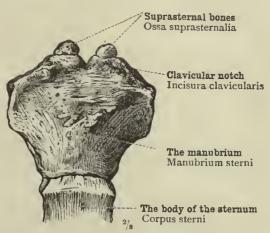


Fig. 90.—The Upper Portion of the Sternum with the Suprasternal Bones (a Rare Variety). Seen from Before.

Sternum—The breast-bone.

Epiphysis of the head Epiphysis capituli



Fig. 91.—Posterior Portion of the Sixth Rib, in the Fifteenth Year.

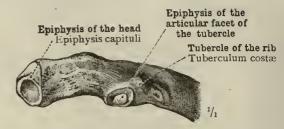


Fig. 92.—Posterior Portion of the Sixth Rib, in the Eighteenth Year.

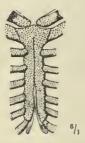


Fig. 93.—Divided Primitive Cartilage of the Sternum.

From a human feetus of two months (months of four weeks each).



Fig. 94.—Primitive Cartilage of the Sternum.

From a human feetus of four months (months of four weeks each).

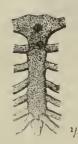


Fig. 95.—Primitive Cartilage of the Sternum with the First Centre of Ossification in the Manubrium.

From a human feetus in the second half of the sixth month (months of four weeks each).

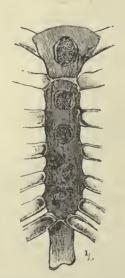


Fig. 96.—Centres of Ossification in the Sternum of a New-Born Child.

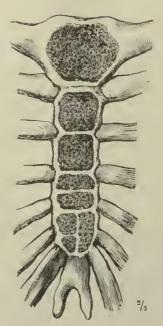


Fig. 97.—Sternum of a Boy at the Age of Eleven Years.

Development of the Ribs and the Sternum.

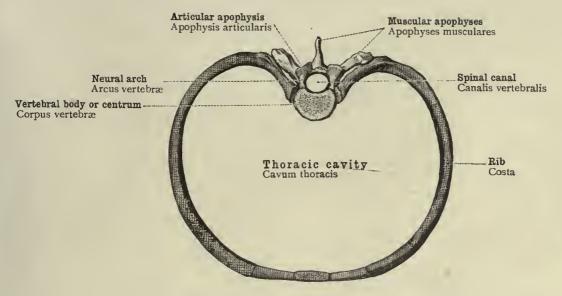


Fig. 98.—Skeleton of a Thoracic Segment.

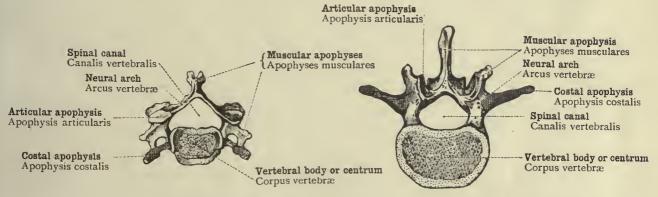


Fig. 99.—Skeleton of a Cervical Segment.

Fig. 100.—Skeleton of a Lumbar Segment.

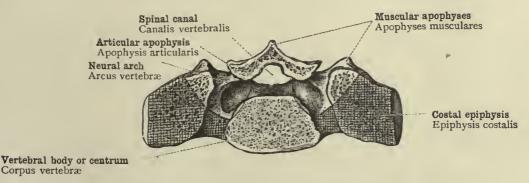
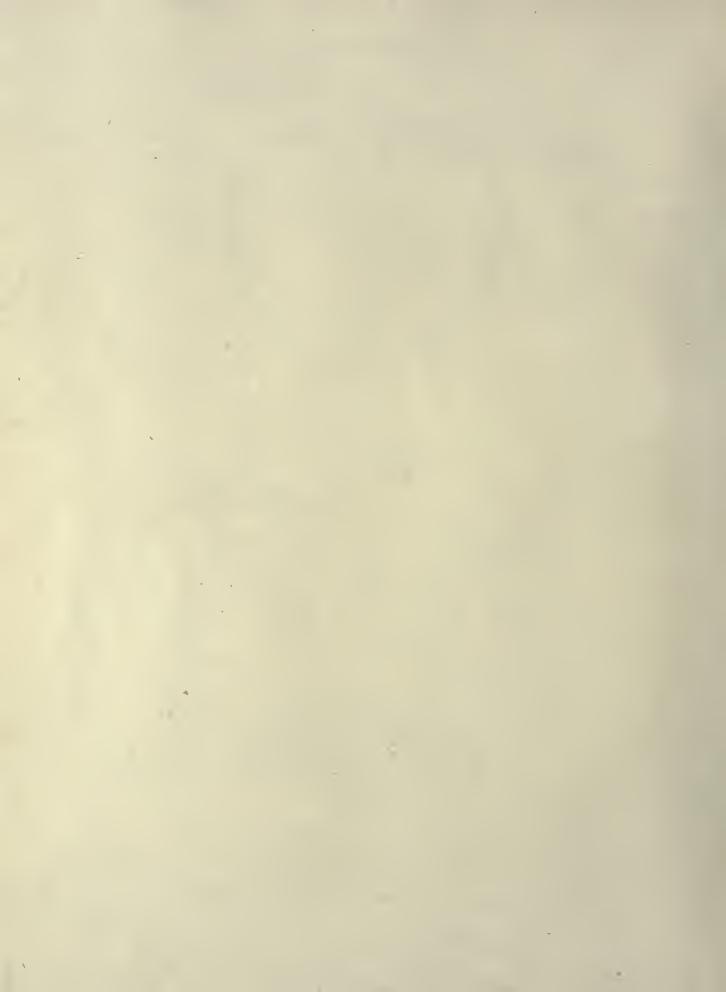


FIG. 161.—SKELETON OF A SACRAL SEGMENT.

The Homologous Skeletal Parts of the Segments of the Body.



## CRANIUM ET OSSA CRANII THE SKULL AND THE BONES OF THE SKULL

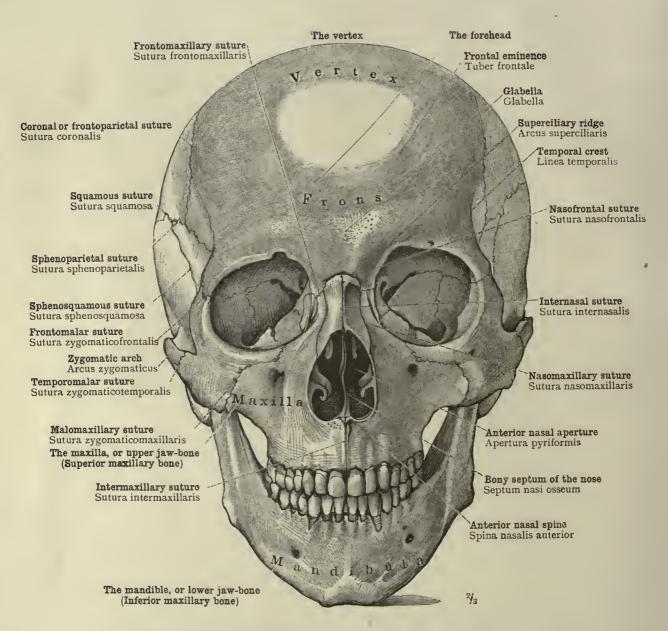


FIG. 102.—THE SKULL SEEN FROM BEFORE: NORMA FRONTALIS.

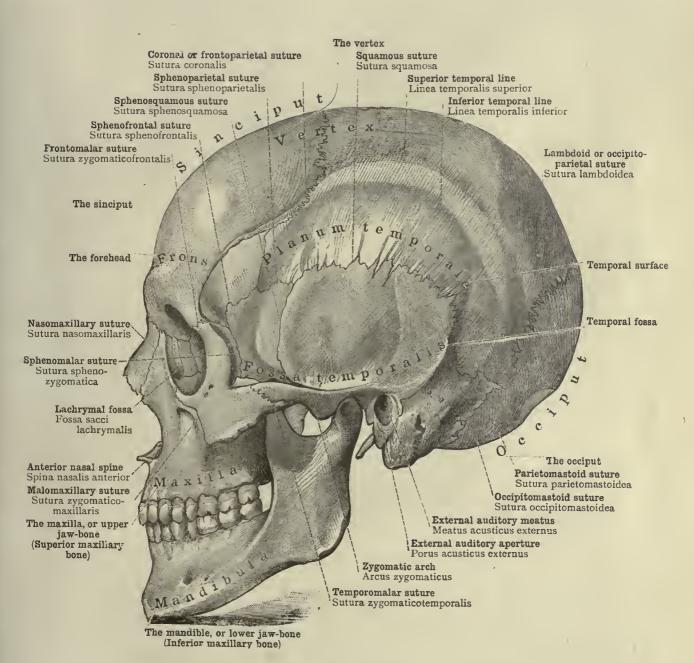
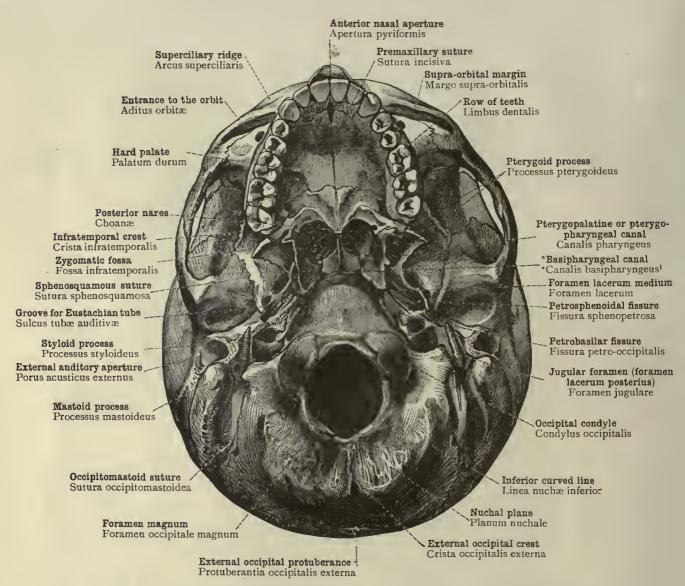
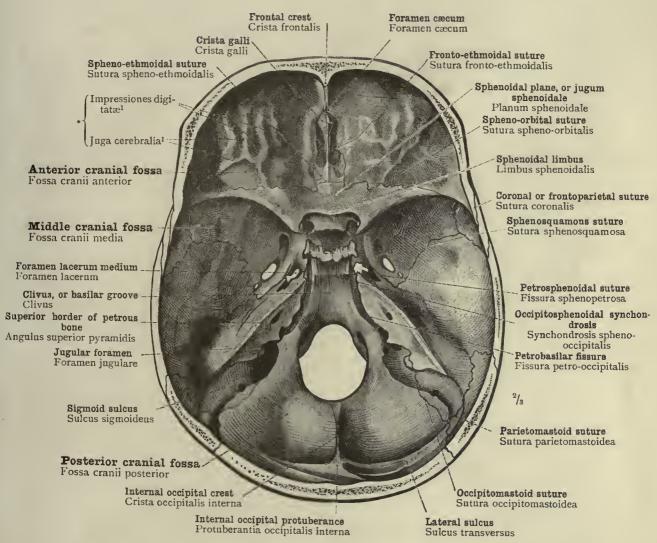


FIG. 103.—THE SKULL SEEN FROM THE LEFT SIDE: NORMA LATERALIS.



1 \*Canalis basipharyngeus,\* basipharyngeal canal: This term is not often used by English anatomists, nor even is the canal itself mentioned by Quain. Macalister, however, in his description of the vomer, writes (p. 233): "In the region of its sphenoidal articulation there are three canals transmitting small vessels in the young skull, which usually become obliterated with advancing age; these are—one median vomerine canal between the vomer and the root of the rostrum, and a lateral on each side between the extremity of the ala vomeris and the vaginal process. These run parallel to, and may communicate with, the pterygopharyngeal [pterygopalatine] canal in the vaginal process." The two lateral canals here mentioned are those called by Toldt \*canales basipharyngei.—Tr.

Fig. 104.—External Aspect of the Base of the Skull: Basis Cranii Externa.



<sup>1</sup> Mouldings of the bone corresponding with the sulci and convolutions of the inferior surface of the frontal lobe of the cerebrum.

FIG. 105.—INTERNAL ASPECT OF THE BASE OF THE SKULL—BASIS CRANII INTERNA: FOSSÆ CRANII ANTERIOR, MEDIA, ET POSTERIOR—THE ANTERIOR, MIDDLE, AND POSTERIOR CRANIAL FOSSÆ. SEEN FROM ABOVE.

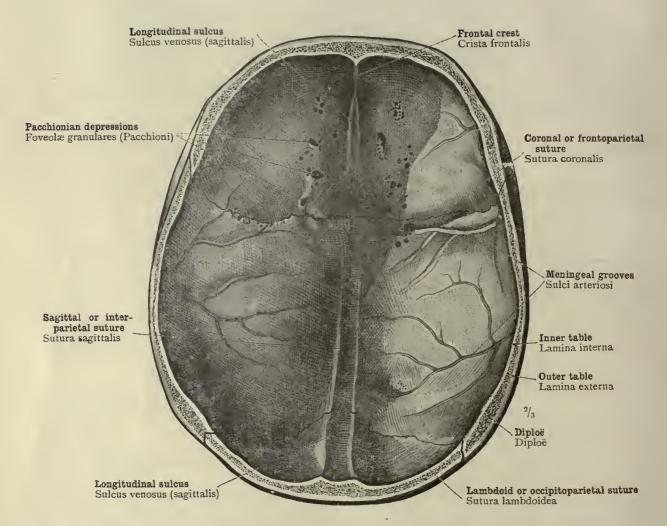


Fig. 106.—Calvaria—The Skullcap, or Roof of the Skull. Inner Aspect.

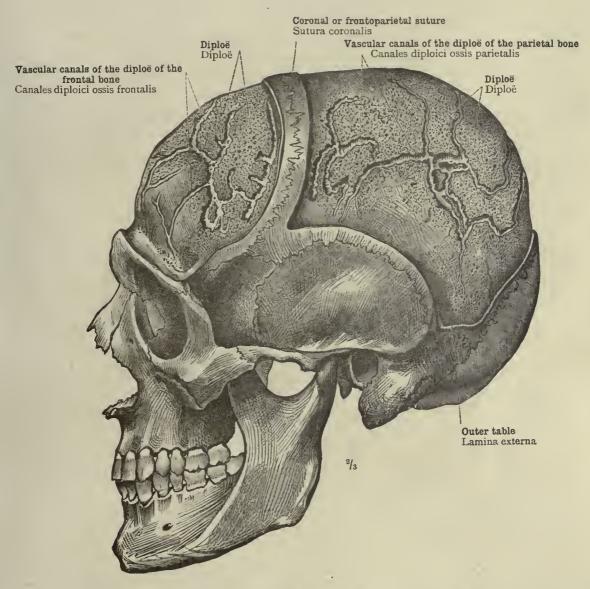


Fig. 107.—Vascular Canals of the Diploë of the Roof of the Skull, shown by Removal of the Outer Table of Compact Boile from the Frontal Bone and the Parietal Bone: Canales Diploici (Brescheti). Seen from the Left Side.

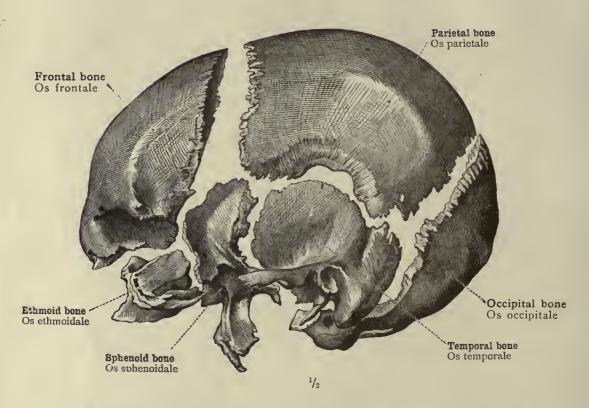


Fig. 108.—The Separate Bones of which the Cranium Cerebrale or Cranium Proper consists,

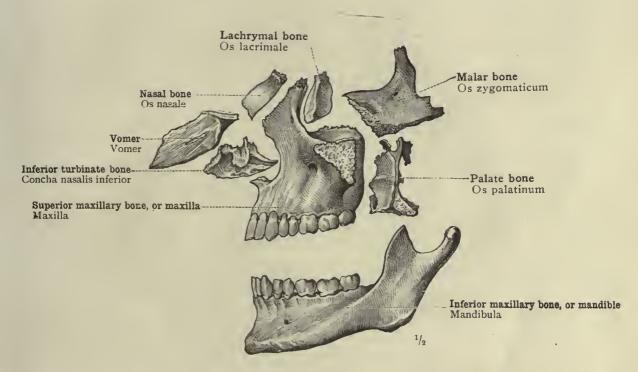


Fig. 109.—The Separate Bones of which the Cranium Viscerale (Facies Ossea), or Facial Portion of the Skull, consists.

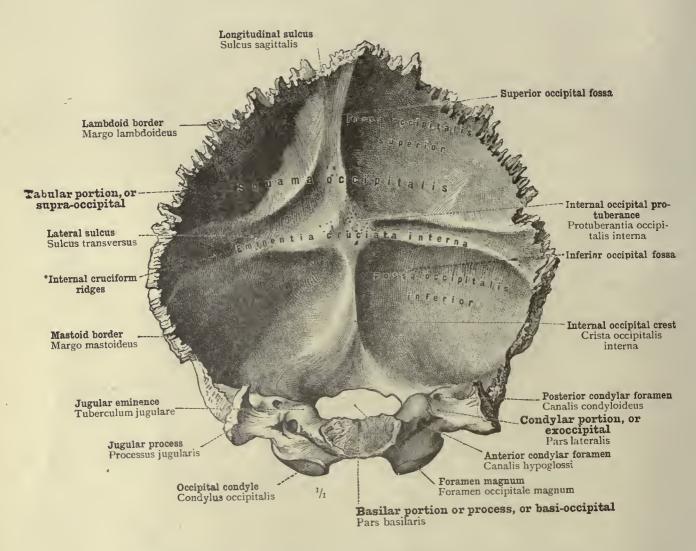
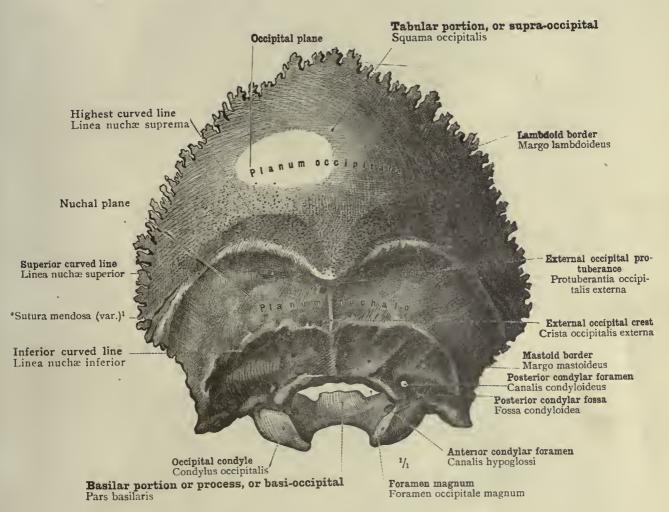


Fig. 110.—Anterior (Internal) Aspect of the Occipital Bone.



1 See foot-note to p. 57-

Fig. 111.—Posterior (External) Aspect of the Occipital Bone.

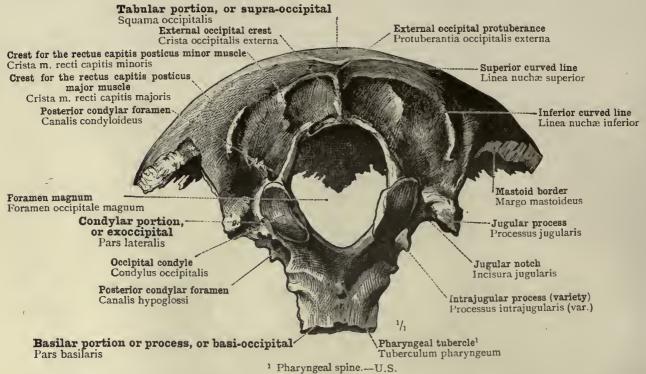


FIG. 112.—THE OCCIPITAL BONE SEEN FROM BELOW (EXTERNAL BASAL SURFACE).

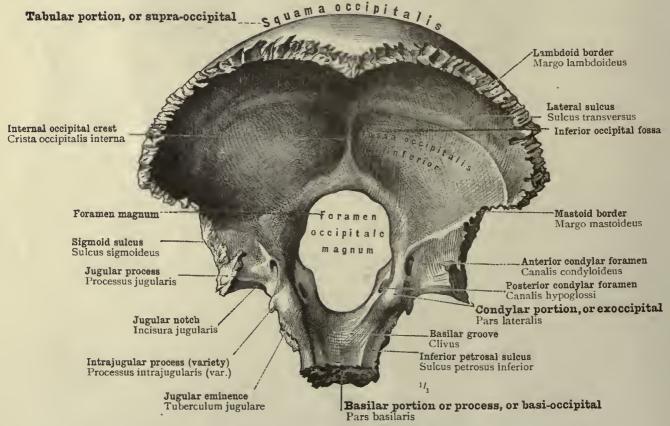
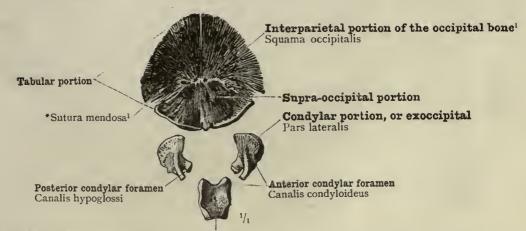


Fig. 113.—The Occipital Bone seen from Above (Internal Basal Surface).

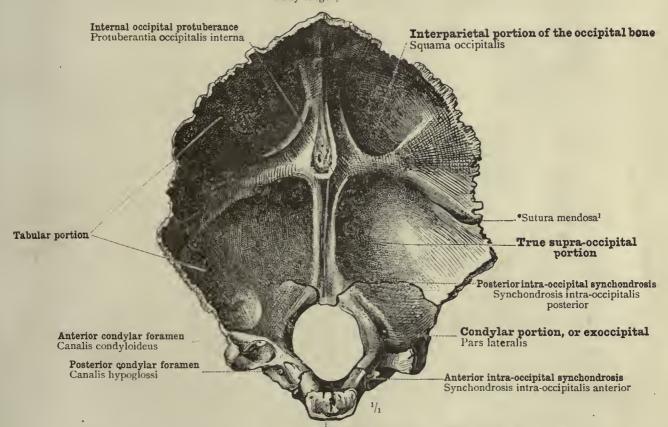
Os occipitale—The occipital bone.



Basilar portion, or basi-occipital—Pars basilaris

FIG. 114.—THE PORTIONS OF THE OCCIPITAL BONE FROM A HUMAN FŒTUS AT THE END OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH). SEEN FROM WITHIN.

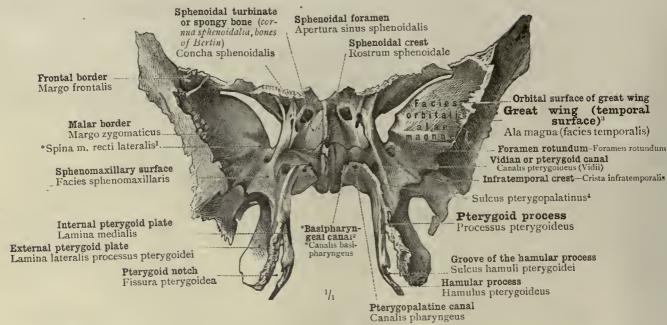
Body-length, 12 inches.



Basilar portion, or basi-occipital—Pars basilaris

Fig. 115.—The Occipital Bone of a Child aged Fifteen Months. Seen from Within.

The human occipital bone consists of four elements, which are still separate at birth, being united by intervening cartilage; these are, the basilar portion, (basilar process), the two condylar portions, and the tabular portion. In comparative anatomy these are known respectively as basi-occipital, exoccipitals, and supra-occipital. The basi-occipital and the exoccipitals ossify each from a single nucleus; the supra-occipital ossifies from four nuclei, an upper pair and a lower. These soon unite, but leave for some time fissures running in along the superior curved line. Not uncommonly this basure persists on one or both sides through life, and in rare cases there is a persistent suture running right across and dividing the tabular portion of the occipital bone into two parts ("Sutura mendosa; see Figs. 111 and 114). Of these two parts, the lower, which belongs in the base of the skull and ossifies in cartilage, is the proper subra-occipital element, homologous with the subra-occipital bone of other vertebrata; whilst the upper, which belongs to the vertex of the skull and ossifies in membrane, represents the interparietal bone of many animals. This part alone is entitled to the name squama occipitalis, a term, however, little used by English anatomists. The occasional persistence of the suture between the interparietal and supra-occipital elements of the occipital bone is of surgical importance, since, in cases of injury to the back of the head, it is, if present, liable to be mistaken for fracture.—Tr.



1 Spine for the attachment of the lower head of the external rectus muscle of the eyeball.

<sup>2</sup> See note to p. 48.

<sup>3</sup> See note to p. 59.

<sup>4</sup> As mentioned in the Preface, the canal called by English anatomists palatomaxillary or posterior palatine canal is by Toldt called pterygopalatine canal. The inner grooved portion of the sphenomaxillary surface, which he here calls the pterygopalatine groove, leads down into that canal, but does not form a part of it, since it lies between the palate bone and the superior maxillary bone.—Tr.

Fig. 116.—The Sphenoid Bone seen from Before.

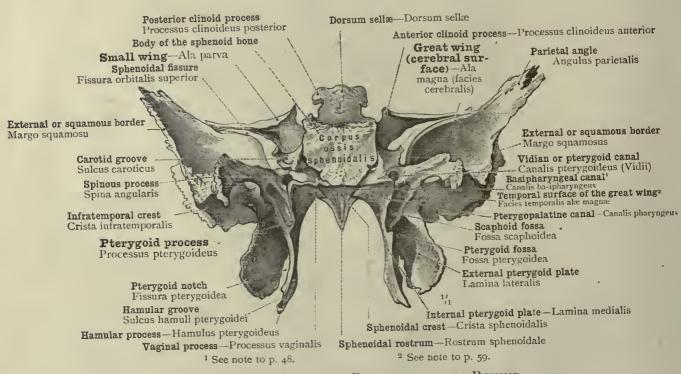


Fig. 117.—The Sphenoid Bone seen from Behind.

Os sphenoidale-The sphenoid bone.

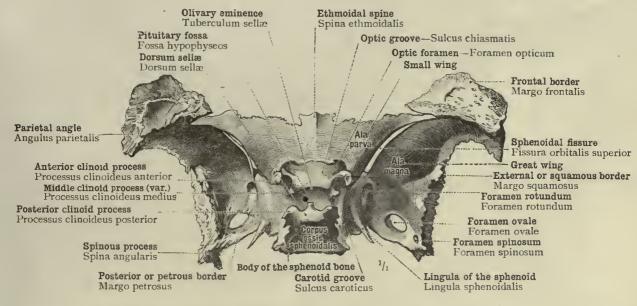
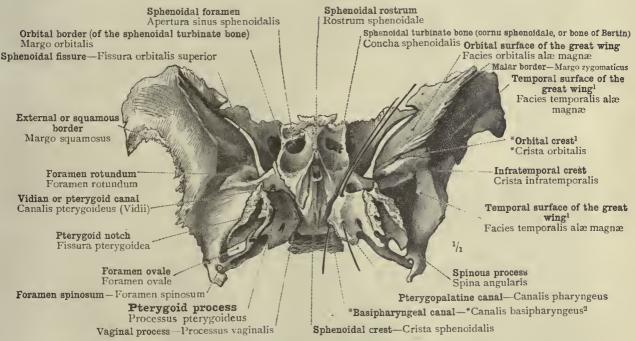


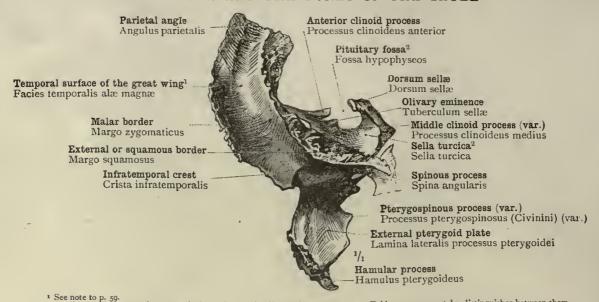
Fig. 118.—The Sphenoid Bone seen from Above (Cerebral Aspect).



The Continental nomenclature differs here from that of English anatomists. What is called by the author facies temporalis also magne, the temporal surface of the great wing, is in England known as the temporazygomatic surface, being divided by the infratemporal crest into an upper temporal surface and a lower sphenomaxillary surface. As regards the term crista orbitalis, the crest, this is not used by Quain at all, while Macalister applies it to the lower margin of the sphenoidal fissure, the free border separating the orbital from the cerebral surface of the great wing. Toldt, on the other hand, as an examintion of Fig. 119 shows, means by crista arbitalis the posterior margin of the sphenomaxillary fissure, free border separating the orbital from the zygomatic surface of the great wing.—Tr.

2 See note to p. 48.

FIG. 119.—THE SPHENOID BONE SEEN FROM BELOW (EXTERNAL ASPECT).



<sup>1</sup> See note to p. 50.
<sup>2</sup> English anatomists use the terms pituitary fossa and sella turcica as synonyms; Toldt, more accurately, distinguishes between them, meaning by pituitary fossa (Fossa hypophyseos) the deep pit on the upper surface of the body of the sphenoid bone which lodges the pituitary body or hypophysis cerebri, and by sella turcica the saddle-shaped surface which forms the floor of that fossa.—Tr.

FIG. 120.—THE SPHENOID BONE SEEN FROM THE LEFT SIDE (TEMPOROZYGOMATIC SURFACE).1

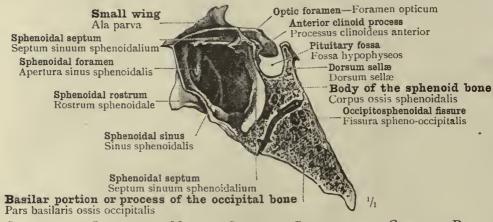


FIG. 121.—THE SPHENOIDAL SINUSES IN MEDIAN SAGITTAL SECTION, THE GREATER PART OF THE SPHENOIDAL SEPTUM HAVING BEEN REMOVED. SEEN FROM THE LEFT SIDE.

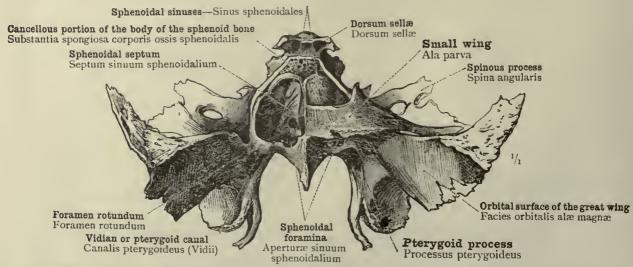


FIG. 122.—THE SPHENOIDAL SINUSES, EXPOSED FROM ABOVE BY THE REMOVAL OF THE INNER LAMELLA OF COMPACT BONE.

The right sinus is opened from above; the left is unopened.

Os sphenoidale—The sphenoid bone.

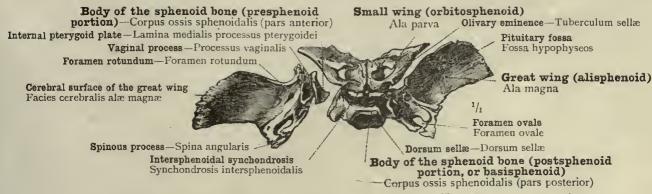


FIG. 123.—THE SPHENOID BONE OF A BOY BORN AT FULL TERM, SEEN FROM ABOVE.

Body-length, 19 inches.

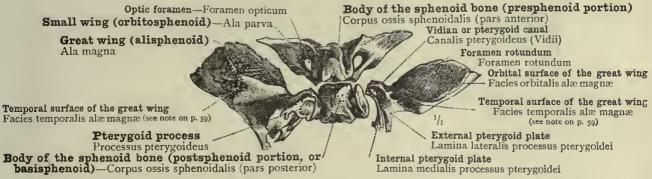
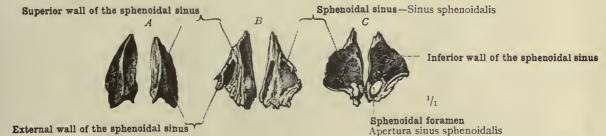


FIG. 124.—THE SPHENOID BONE OF A BOY BORN AT FULL TERM, SEEN FROM BELOW. Body-length, 19 inches.



IN THE SECOND YEAR OF LIFE. IN THE SIXTH YEAR OF LIFE. IN THE EIGHTH YEAR OF LIFE.

FIG. 125.—CONCHÆ SPHENOIDALES—THE SPHENOIDAL TURBINATE BONES. SEEN FROM ABOVE.

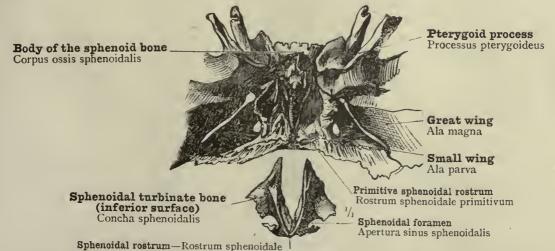
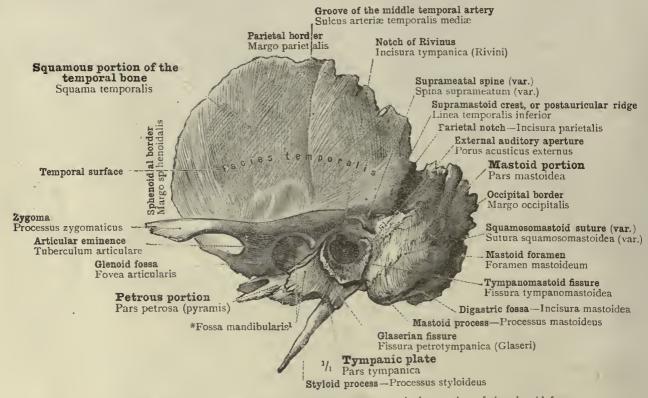


FIG. 126.—THE RELATION OF THE SPHENOIDAL TURBINATE BONES TO THE INFERIOR SURFACE OF THE SPHENOID BONE IN THE SIXTH YEAR OF LIFE.



<sup>1</sup> What is called the mandibular fossa by Toldt is the posteror non-articular portion of the glenoid fossa (separated from the articular portion by the Glaserian fissure). Its floor is formed by the tympanic plate, and it lodges a portion of the parotid gland.—Tr.

FIG. 127.—THE LEFT TEMPORAL BONE SEEN FROM THE OUTER SIDE (TEMPORAL SURFACE).

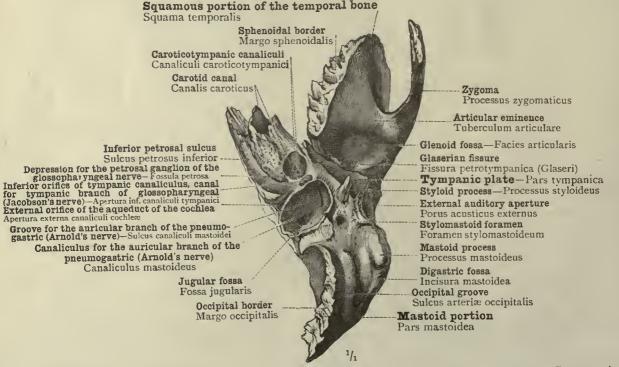


Fig. 128.—The Left Temporal Bone seen from Below (External Basal Surface).

Os temporale—The temporal bone.

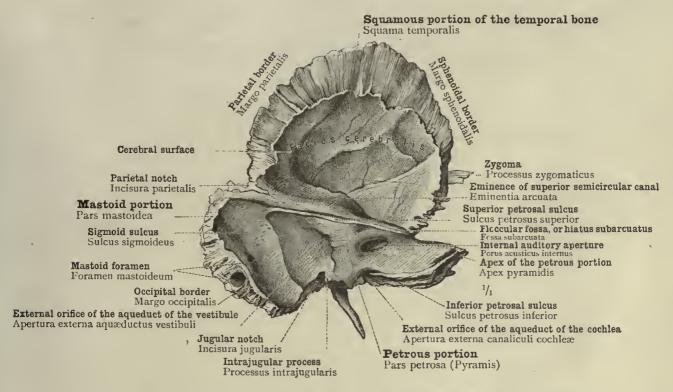


FIG. 129.—THE LEFT TEMPORAL BONE SEEN FROM WITHIN (CEREBRAL SURFACE).

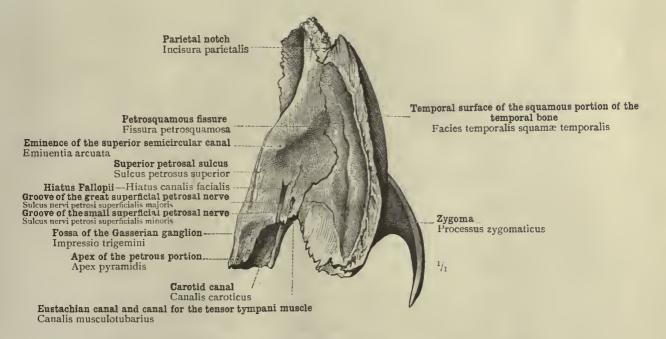
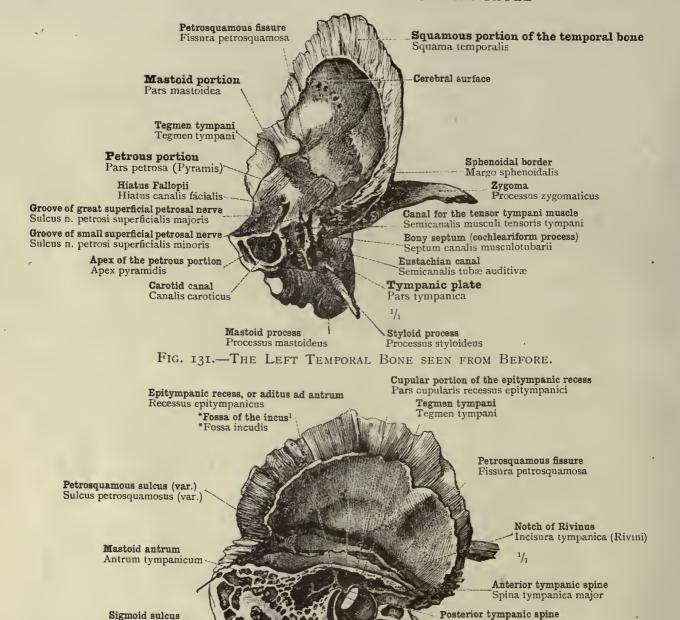


FIG. 130.—THE LEFT TEMPORAL BONE SEEN FROM ABOVE (INTERNAL BASAL SURFACE).

Os temporale—The temporal bone.



Aqueduct of Fallopius—Canalis facialis (Fallopii)/ Inferior orifice of the canal for the chorda tympani nerve/ (iter chordæ posterius)

Sulcus sigmoideus-

Cellulæ mastoideæ

Mastoid cells

Canaliculus chordæ tympani (Apertura inferior)

Tympanic orifics of canal for chorda tympani nerve Canaliculus chordæ tympani (Apertura tympanica) Vaginal process—Vagina processus styloidei Styloid prominence—Prominentia styloidea Stylomastoid foramen-Foramen stylomastoideum Canaliculus for auricular branch of pneumogastric (Arnold's nerve)

Spina tympanica minor Tympanic sinus Sinus posterior

Tympanic sulcus—Sulcus tympanicus

<sup>1</sup> \*Fossa of the incus.—'The shorter process (crus breve) of the incus projects hackwards. Its extremity is tipped with cartilage and is ... articulated by ligamentous fibres [ligament of the incus] with the posterior and partly with the outer wall of the tympanum near the entrance to the mastoid cells. The place where the ligamentous fibres are attached to the wall of the tympanum is somewhat depressed, and has a covering of cartilage.—Quain's 'Anatomy,' tenth edition, vol. iii., part iii., p. 90. Fossa of the incus is a most suitable name for this depressed cartilage-covered area, and may well be adopted by English anatomists.—Tr.

Canaliculus mastoideus

Fig. 132.—The External Wall of the Tympanum and the Mastoid Cells displayed by A SECTION THROUGH THE LEFT TEMPORAL BONE IN A PLANE PARALLEL WITH THE SQUAMOUS PORTION OF THAT BONE.

The petrosquamous sulcus (along which a sound has been passed) is in this specimen partly bridged over by bone; anteriorly it communicates with the outer surface of the bone by means of a spurious jugular foramen-foramen jugulare spurium (Variety).

Os temporale—The temporal bone.

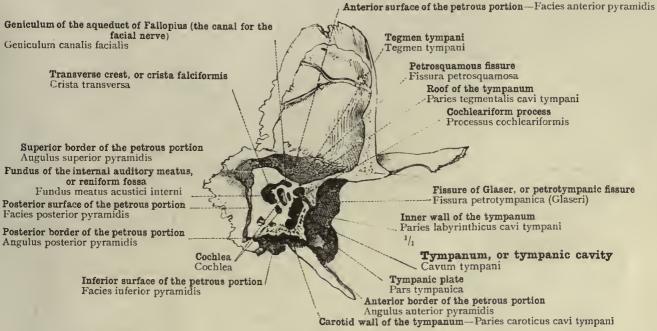


Fig. 133.—Vertical Section through the Petrous Portion of the Left Temporal Bone and through the Anterior Part of the Squamous Portion. (Nomenclature of the Surface and Borders of the Petrous Portion.)

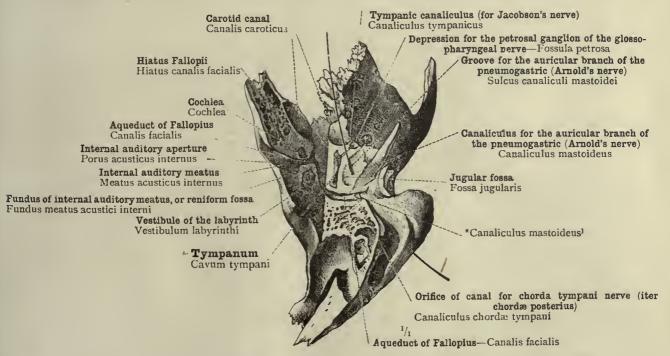


FIG. 134.—AQUEDUCTUS FALLOPII, OR CANAL FOR THE FACIAL NERVE, SHOWN FROM BENEATH BY THE REMOVAL OF A WEDGE-SHAPED PIECE FROM THE PETROUS PORTION OF THE LEFT TEMPORAL BONE.

The canaliculus tympanicus, for the tympanic branch of the glossopharyngeal nerve (Jacobson's nerve), is also opened up throughout its whole length. A sound has been passed through the canaliculus for the auricular branch of the pneumogastric nerve (nerve of Arnold). In the Continental nomenclature this canaliculus is known as the canaliculus mastoideus.

Os temporale—Temporal bone.

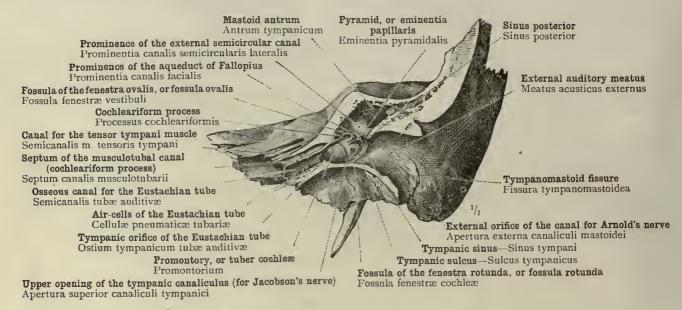


Fig. 135.—Vertical Section through the Left Temporal Bone in a Plane parallel with the Superior Border of the Petrous Portion, and passing through the Middle of the External Auditory Meatus, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts.

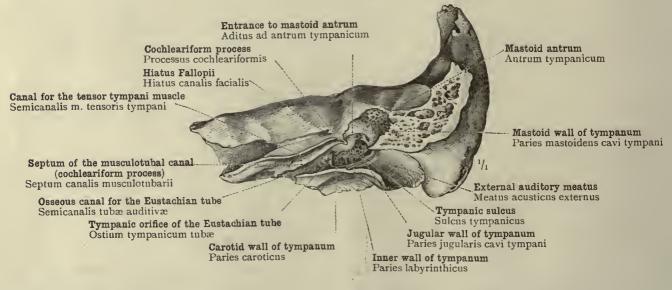


Fig. 136. Vertical Section through the Left Temporal Bone in a Plane parallel with the Superior Border of the Petrous Portion, the Section passing along the Posterior Wall of the External Auditory Meatus, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts.

Os temporale—Temporal bone.

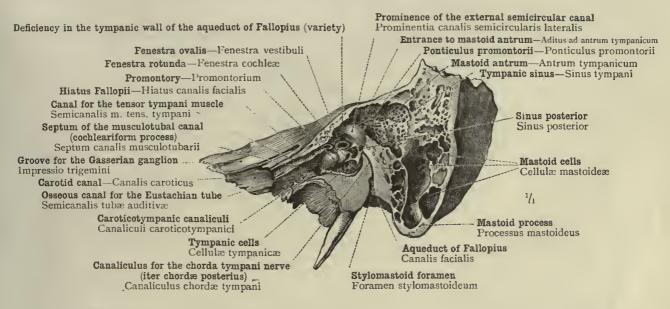


Fig. 137.—Vertical Section through the Left Temporal Bone, crossing obliquely the Superior Border of the Petrous Portion, and passing through the Anterior Portion of the Mastoid Process, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts (especially the Mastoid Antrum and the Mastoid Cells).

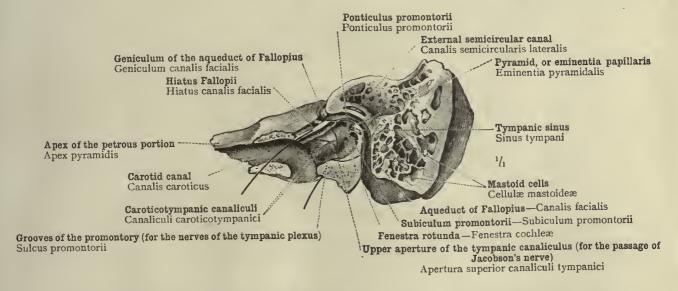


Fig. 138.—Vertical Section through the Left Temporal Bone, crossing obliquely the Superior Border of the Petrous Portion, and passing through the Posterior Portion of the Mastoid Process, to demonstrate the Tympanic Cavity, Cavum Tympani, and the Adjoining Parts.

A bristle has been passed through the canaliculus tympanicus (the canal for Jacobson's nerve—the tympanic branch of the glossopharyngeal nerve) into the tympanum, and, after traversing this cavity, leaves it by the canaliculus that opens into the groove for the small superficial petrosal nerve.

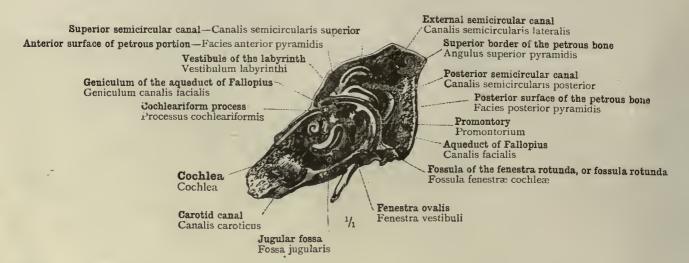
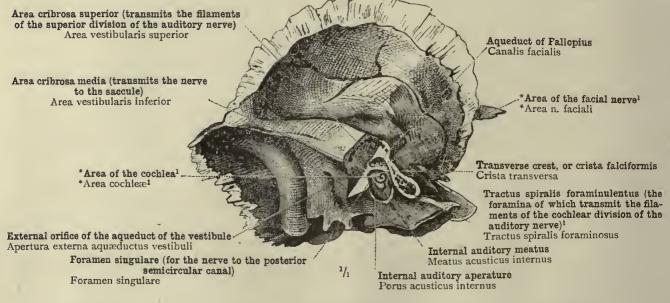
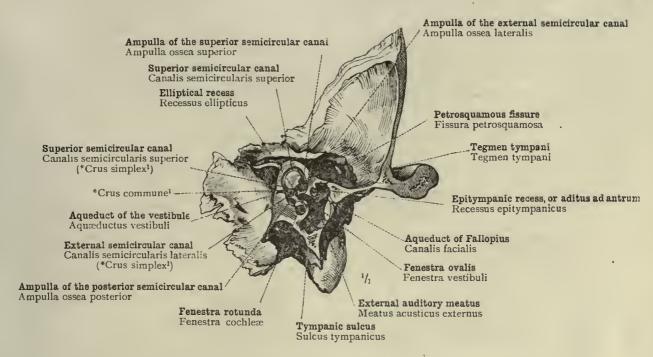


Fig. 139.—The Bony Labyrinth, Labyrinthus Osseus, shown in the Left Petrous Portion. Seen obliquely from in Front and Below. The Osseous Semicircular Canals and also the Canal of the Cochlea have been partly opened. The Relations between the Aqueduct of Fallopius and the Osseous Labyrinth are clearly shown.



<sup>1</sup> The helicoid depression of the tractus spiralis foraminulentus corresponds with the base of the cochlea, and at the centre of the helix is the foramen centrale cochleæ, the orifice of the central canal of the modiolus. On the significance of this term *Area of the Cochlea*, see also note <sup>534</sup>, p. 956y, in the Appendix to Part VI.; and on the significance of the term *Area of the Facial Nerve*, see note <sup>538</sup> on the same page.

FIG. 140.—THE INTERNAL AUDITORY MEATUS, MEATUS ACUSTICUS INTERNUS, EXPOSED FROM ABOVE BY THE REMOVAL OF A RIGHT-ANGLED WEDGE FROM THE PETROUS PORTION OF THE LEFT TEMPORAL BONE, DISPLAYING THE FUNDUS OF THE INTERNAL AUDITORY MEATUS, OR RENIFORM FOSSA. DIVIDED BY THE TRANSVERSE CREST, OR CRISTA FALCIFORMIS, INTO SUPERIOR AND INFERIOR FOSSÆ. SEEN FROM BEHIND AND ABOVE.



<sup>1</sup> Regarding the signification of the terms crus simplex and crus commune, see Appendix to Part VI., p. 956y, note <sup>529</sup>.

Fig. 141.—Portions of the Osseous Labyrinth and the Tympanum, shown in the Left Temporal Bone by a Vertical Section through the Petrous Portion in the Plane of the Superior Semicircular Canal. Seen obliquely from in Front and Within.

The fenestra ovalis is divided vertically.

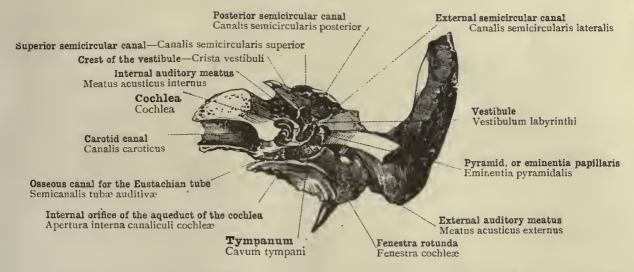
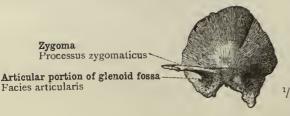


FIG. 142.—PORTIONS OF THE OSSEOUS LABYRINTH AND THE TYMPANUM, SHOWN IN THE LEFT TEMPORAL BONE BY A HORIZONTAL SECTION THROUGH THE PETROUS PORTION ALONG THE INTERNAL AND THE EXTERNAL AUDITORY MEATUS. SEEN FROM ABOVE.

Os temporale-Temporal bone.

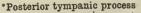




Zygoma Processus zygomaticus

Epitympanic recess Recessus epitympanicus

SQUAMOUS PORTION OF TEMPORAL BONE-SQUAMA TEMPORALIS.



- \*Processus tympanicus posterior
- \*Anterior tympanic process
- \*Processus tympanicus anterior



\*Posterior tympanic process
\*Processus tympanicus posterior
\*Anterior tympanic process

\*Processus tympanicus anterior Sulcus mallei Sulcus mallei

TYMPANIC RING-ANNULUS TYMPANICUS.

Tegmen tympani
Tegmen tympani
Apex of the petrous portion
Apex pyramidis
Canal for tensor tympani muscle
Semicanalis m. tensoris tympani
Tympanum
Cavum tympani

Tegmen tympani—Tegmen tympani
Eminence of the superior semicircular canal—Eminentia arcuata
Hiatus subarcuatus (corresponding with the floccular fossa of
lower vertebrata—Fossa subarcuata
Apex of petrous portion—Apex pyramidis
Internal auditory aperture
Porus acusticus internus

External orifice of the aqueduct of the vestibule Apertura externa aquæductus vestibuli

PETROUS PORTION OF TEMPORAL BONE-PARS PETROSA (PYRAMIS).

FIG. 143.—SEEN FROM WITHOUT.

THE THREE PARTS OF THE LEFT TEMPORAL BONE FROM AN EIGHT-MONTHS FŒTUS (MONTHS OF FOUR WEEKS EACH).

Body-length, 15\frac{1}{2} inches.

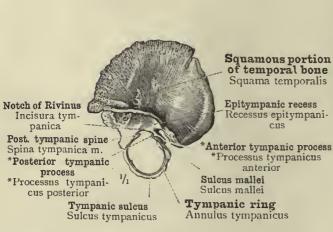


Fig. 145.—The Squamous Portion of the Temporal Bone and the Tympanic Ring united. Seen from Within.

From a feetus at term (body-length, 19 inches).

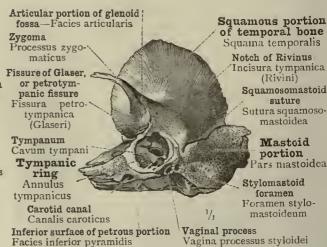


Fig. 146.—The Three Portions of the Left Temporal Bone united. Seen from Without and Below.

From a new-born male infant (body-length, 21 inches).

Development of the Temporal Bones.

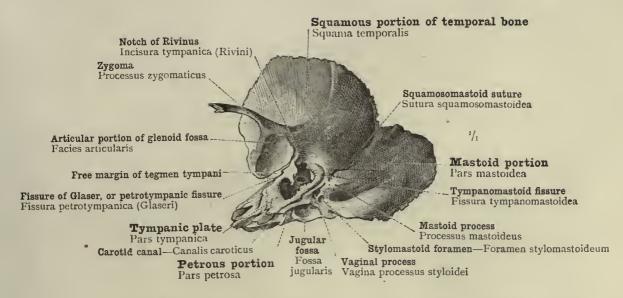


FIG. 147.—THE LEFT TEMPORAL BONE OF A BOY AT THE AGE OF EIGHT MONTHS: FORMATION OF THE TYMPANIC PLATE AND OF THE EXTERNAL AUDITORY MEATUS. SEEN OBLIQUELY FROM WITHOUT AND BELOW.

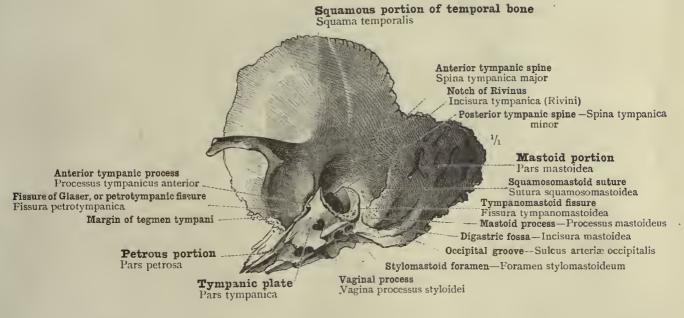


FIG. 148.—THE LEFT TEMPORAL BONE OF A GIRL AT THE AGE OF THREE YEARS: FORMATION OF THE TYMPANIC PLATE AND OF THE EXTERNAL AUDITORY MEATUS. SEEN OBLIQUELY FROM WITHOUT AND BELOW.

Development of the Temporal Bones.

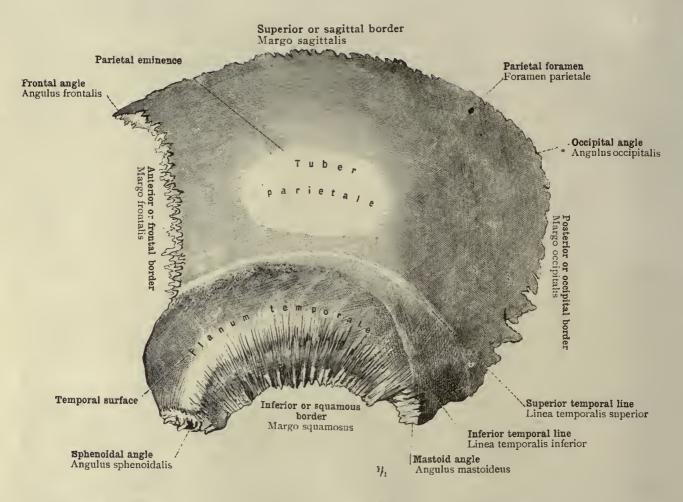


FIG. 149.—THE LEFT PARIETAL BONE SEEN FROM WITHOUT. EXTERNAL SURFACE: FACIES PARIETALIS.

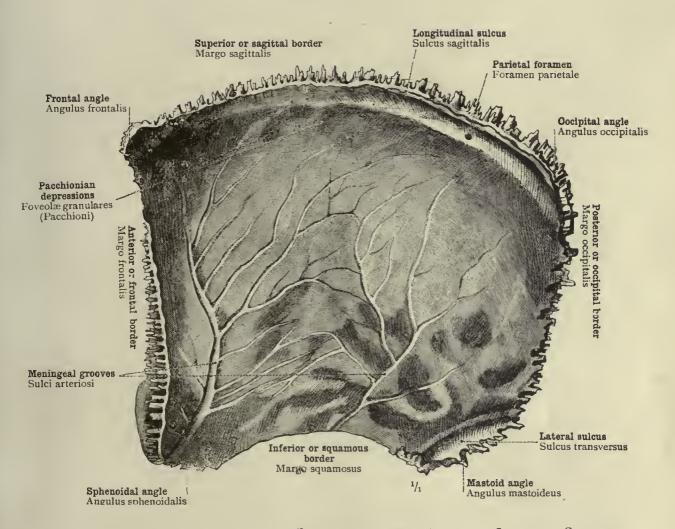


Fig. 150.—The Right Parietal Bone seen from Without. Internal Surface: Facies Cerebralis.

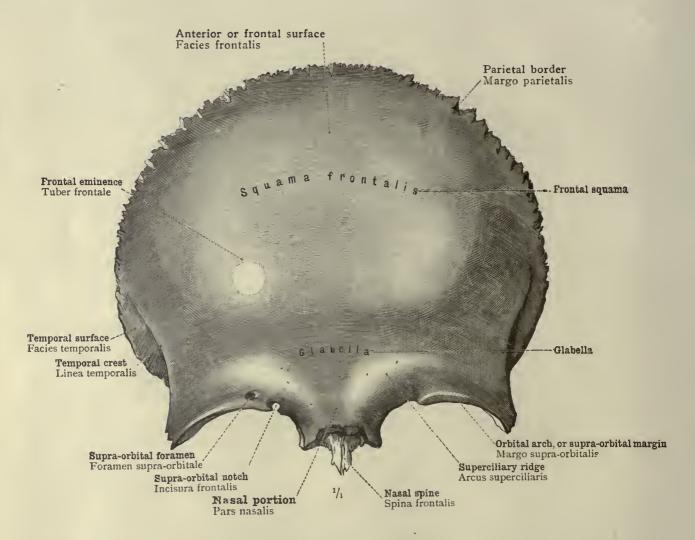
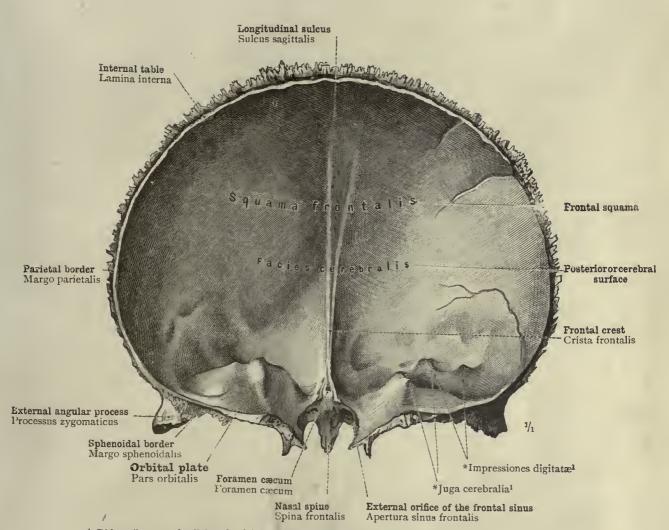
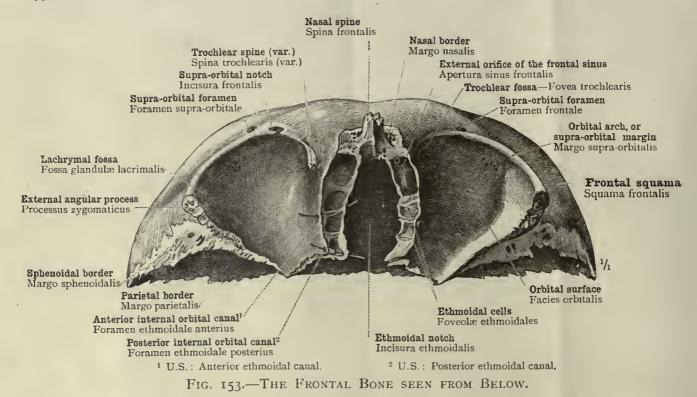


Fig. 151.—The Frontal Bone seen from Before. External Surface: Facies Frontalis.



<sup>1</sup> Ridges (juga cerebralia) and sulci (impressiones digitatæ) corresponding respectively to the sulci and convolutions of the superjacent portion of the frontal lobes of the cerebrum.—TR.

FIG. 152.—THE FRONTAL BONE SEEN FROM BEHIND. INTERNAL SURFACE: FACIES CEREBRALIS.



Frontal sinus Sinus frontalis Internal table Supra-orbital foramen Lamina (compacta) interna Foramen supra-orbitale External table Lamina (compacta) externa Frontal squama Squama frontalis Diploe Diploè Orbital arch, or Nasal border supra-orbital margin Margo nasalis Margo supra-orbitalis External angular process Processus zygomaticus Nasal spine Orbital plate Spina frontalis Pars orbitalis Septum between the frontal sinuses Frontal sinus-Sinus frontalis Septum sinuum frontalium Ethmoidal cell-Foveola ethmoidalis Anterior internal orbital canal External orifices of the frontal sinuses Foramen ethmoidale anterius Apertura sinuum frontalium

<sup>1</sup> U.S.: Anterior ethmoidal canal.

FIG. 154.—THE FRONTAL SINUSES, SINUS FRONTALES, SHOWN BY THE REMOVAL OF THE EXTERNAL TABLE AND THE DIPLOË, AND PARTLY OPENED UP. SEEN FROM BEFORE AND BELOW.

Os frontale-Frontal bone.

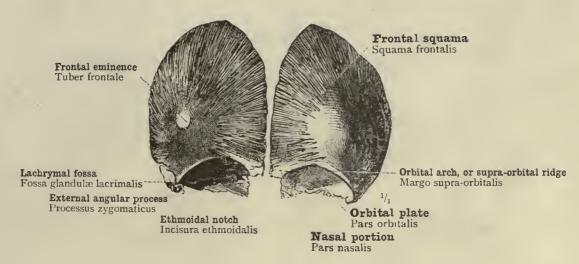


Fig. 155.—The Two Halves of the Frontal Bone from a Human Fœtus in the Eighth Month (Months of Four Weeks Each). Seen from Before.

Body-length of fœtus 15 inches.

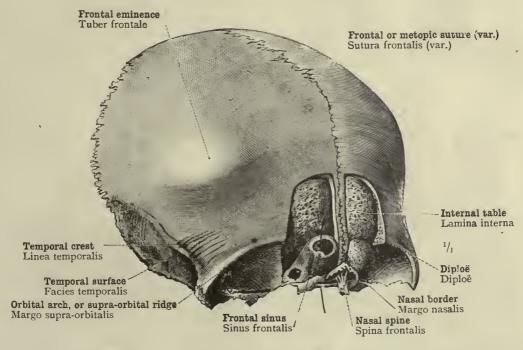


FIG. 156.—THE FRONTAL BONE OF A GIRL AGED SEVEN YEARS IN WHICH THE FRONTAL SINUSES HAVE BEEN EXPOSED. SEEN OBLIQUELY FROM BEFORE AND FROM THE RIGHT SIDE.

Development of the Frontal Bones.

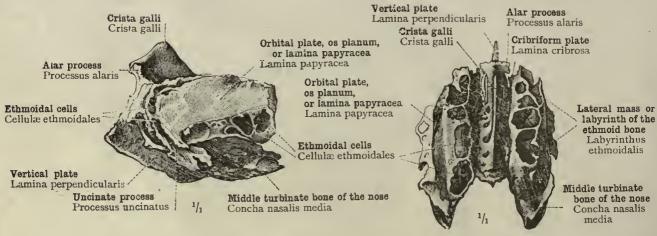


FIG. 157.—THE ETHMOID BONE SEEN FROM THE LEFT SIDE

Fig. 158.—The Ethmoid Bone seen from Above.

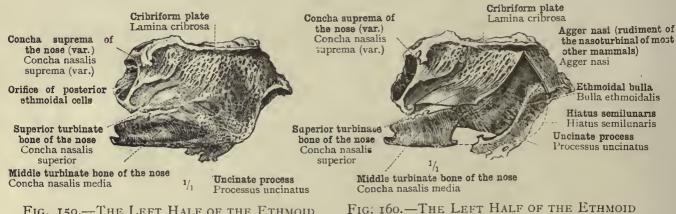


Fig. 159.—The Left Half of the Ethmoid Bone seen from Within. Superior and Middle Turbinate Bones. Fig. 160.—The Left Half of the Ethmoid Bone seen from Within.

The anterior portion of the middle turbinate bone of the nose has been removed.

The free border of the removed portion is indicated by a dotted line.

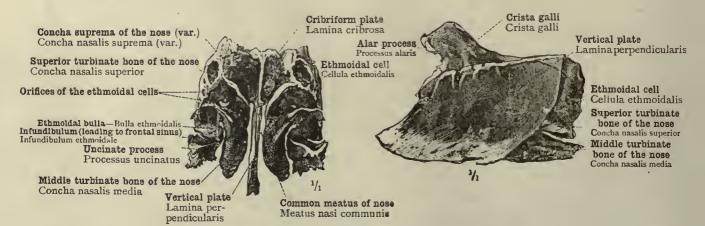


FIG. 161.—THE ETHMOID BONE SEEN FROM BEHIND AND BELOW. VERTICAL PLATE OF THE ETHMOID AS UPPER PART OF THE BONY SEPTUM OF THE NOSE.

Fig. 162.—An Ethmoid Bone the Left Lateral Mass of which has been removed.

The entire surface of the vertical plate is exposed.

Os ethmoidale-Ethmoid bone.

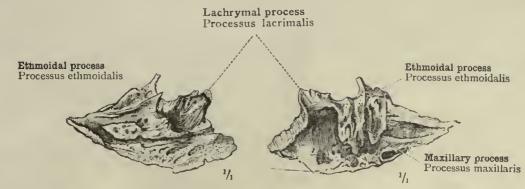


Fig. 163.—Inner Surface.

FIG. 164.—OUTER SURFACE.

CONCHA NASALIS INFERIOR—THE INFERIOR TURBINATE BONE OF THE LEFT SIDE.



Fig. 165.—External Surface.



Fig. 166.—Internal Surface.



Fig. 167.—Anterior Surface.



Fig. 168.—Posterior Surface.

Os Lacrimale: Lachrymal Bone of the Left Side.

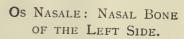




FIG. 169.—SEEN FROM THE LEFT SIDE.



FIG. 170.—SEEN FROM ABOVE.

VOMER-THE VOMER.

Bones of the Nasal Region.

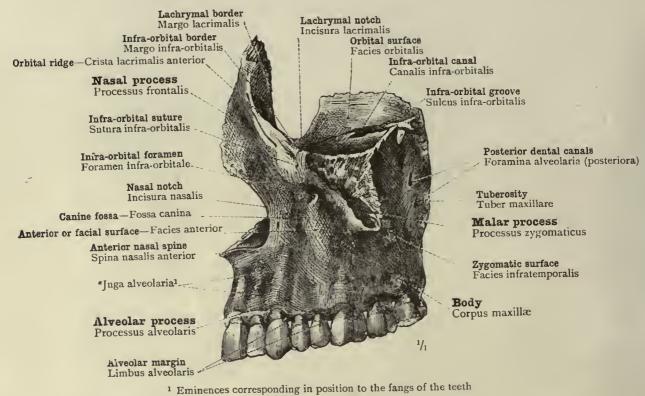


FIG. 171.—LEFT SUPERIOR MAXILLARY BONE: EXTERNAL SURFACE.

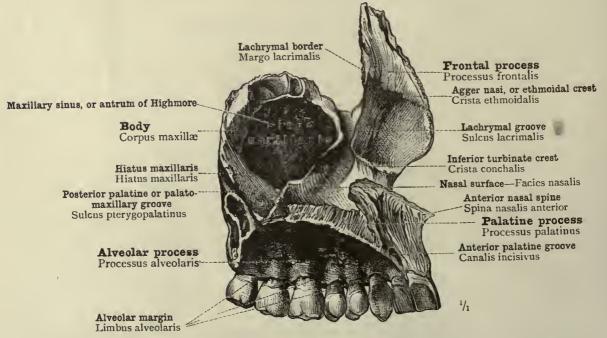


Fig. 172.—Left Superior Maxillary Bone: Internal Surface. View into the Maxillary Sinus, or Antrum of Highmore.

Maxilla-Superior maxilla.

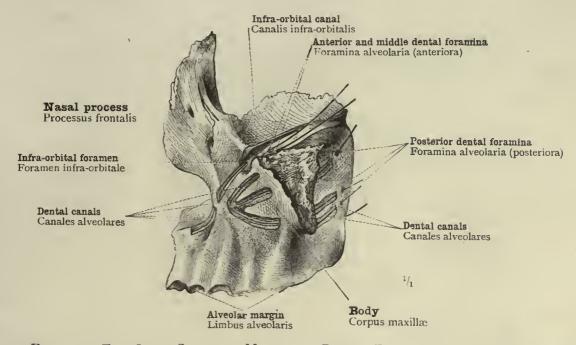


FIG. 173.—THE LEFT SUPERIOR MAXILLARY BONE. EXTERNAL SURFACE.

The dental canals are exposed by partial removal of the superficial plate of bone, and their course is shown by means of bristles passed through them.

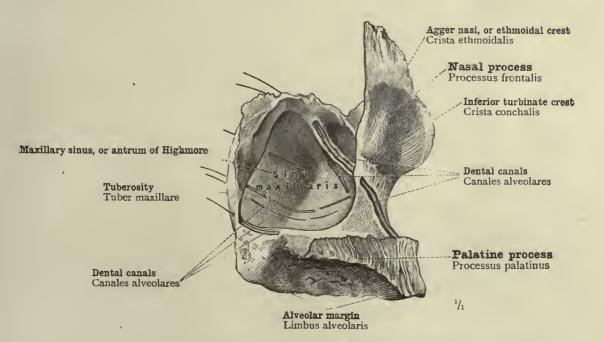


Fig. 174.—The Left Superior Maxillary Bone. Internal Surface.

The foremost and the hindmost of the dental canals have been exposed by the removal of the superficial plate of bone. By means of bristles passed through the canals the situation of the respective dental foremina is indicated. Most of the inner wall of the antrum of Highmore has been cut away.

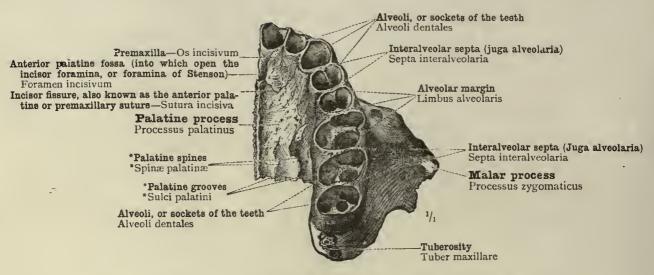


Fig. 175.—The Left Superior Maxillary Bone. Seen from Below.

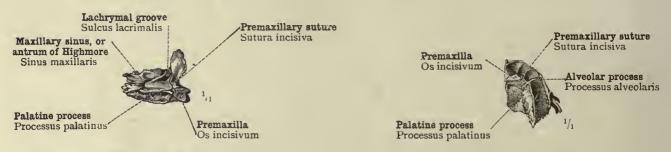


Fig. 176.—Seen from the Inner Side.

Fig. 177.—Seen from Below.

THE LEFT SUPERIOR MAXILLARY BONE OF A FŒTUS AT THE END OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH).

Body-length, 12 inches.

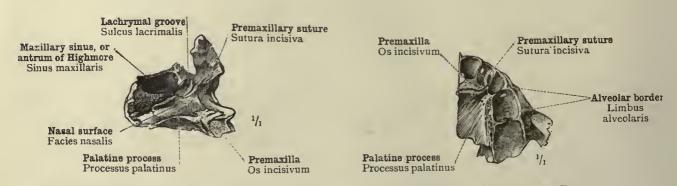


FIG. 178.—SEEN FROM THE INNER SIDE.

Fig. 179. Seen from Below.

THE LEFT SUPERIOR MAXILLARY BONE OF A BOY BORN AT FULL TERM.

Body-length, 21 inches.

Maxilla—Superior maxillary bone.

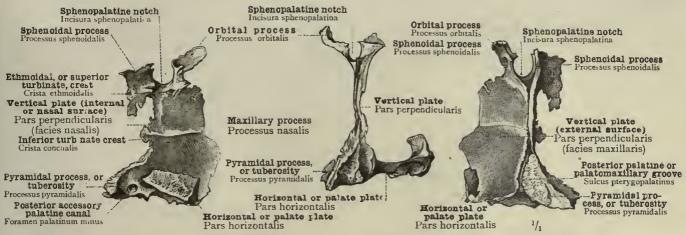


Fig. 180.—Inner Surface. Fig. 181.—Seen from Behind. Fig. 182.—Outer Surface. Os Palatinum.—The Palate-Bone (of the Left Side).

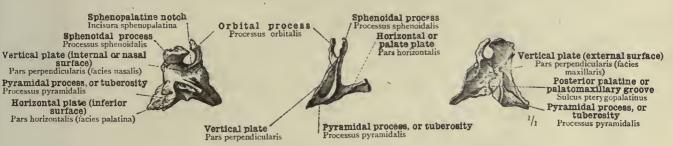


Fig. 183.—Inner Surface. Fig. 184.—Seen from Behind. Fig. 185.—Outer Surface. The Left Palate-Bone of a Boy born at Full Term.

Body-length, 21 inches.

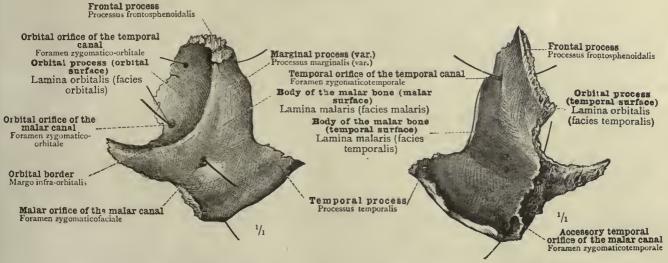


Fig. 186.—Seen from Before.

Fig. 187.—SEEN FROM BEHIND.

Os Zygomaticum-Malar Bone (of the Left Side).

Supplementary Bones of the Upper Jaw.

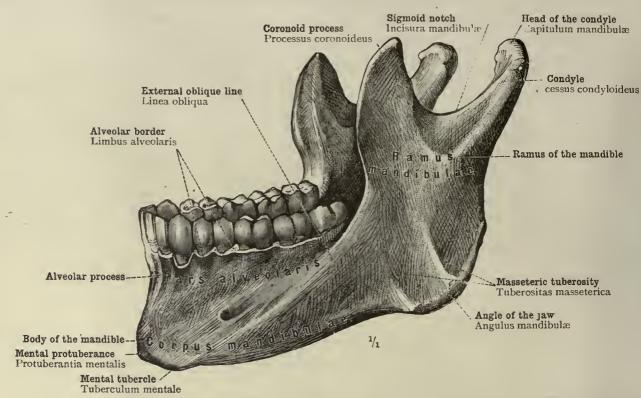


Fig. 188.—The Inferior Maxillary Bone seen from the Left Side.

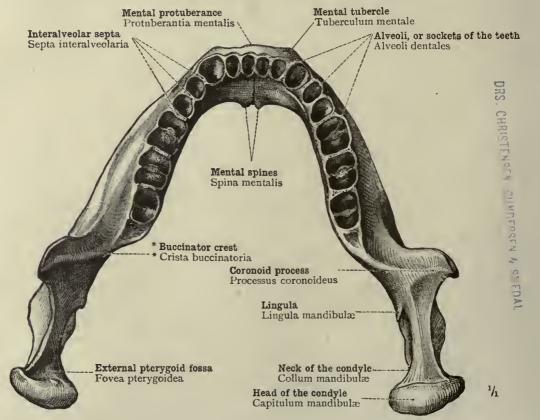


Fig. 189.—The Inferior Maxillary Bone seen from Above.

Mandibula-The inferior maxillary bone, lower jaw, or mandible.

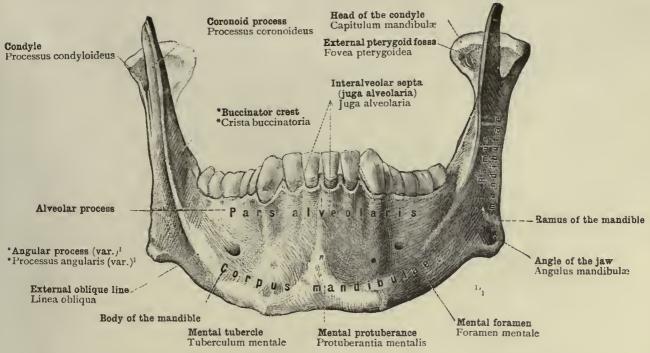


Fig. 190.—The Inferior Maxillary Bone seen from Before.

1 "The angle of the jaw," writes Quain, "... is more or less rounded off." The specimen from which Fig. 190 was drawn has, however, an abnormal projection at each angle, to which in the German nomenclature the name processus angularis (var.) is given. This variety is not described by Quain or by Macalister.—Tr.

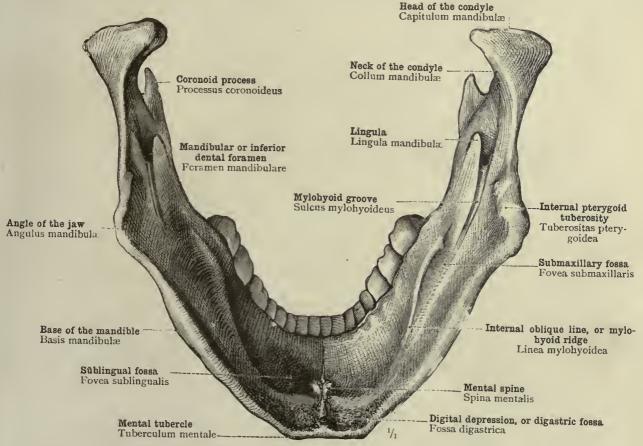


Fig. 191.—The Inferior Maxillary Bone seen from Behind.

Mandibula-The inferior maxillary bone, lower jaw, or mandible.

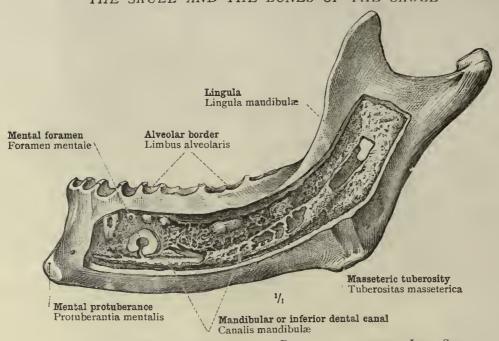
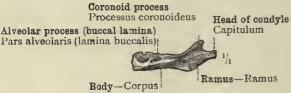


FIG. 192.—THE INFERIOR MAXILLARY BONE SEEN FROM THE LEFT SIDE. The mandibular or inferior dental canal has been exposed by the removal of a portion of the superficial plate of bone,

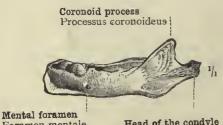


SEEN FROM THE OUTER SIDE.

Alveolar process (lingual lamina) Pars alveolaris (lamina lingualis) Alveolar process (buccal lamina) Ramus-Ramus l ars alveolaris (lamina buccalis) Lingula-Lingula Body-Corpus

SEEN FROM THE INNER SIDE.

FIG. 193.—THE LEFT HALF OF THE INFERIOR MAXILLARY BONE OF A HUMAN EMBRYO AT THE END OF THE FIFTH MONTH (MONTHS OF FOUR WEEKS EACH). Body-length, 71 inches.



Foramen mentale

Alveolus or so et

Head of the condyle Capitulum

Ramus-Ramus Alveolar process (buccal lamina) Pars alveolaris (lamina buccalis) Lingula Lingula

Alveolar process (lingual lamina) Pars alveolaris (lamina lingualis)

Plane of union with the right half of the inferior maxillary bone

SEEN FROM THE INNER SIDE.

SEEN FROM THE OUTER SIDE. FIG. 194.—THE LEFT HALF OF THE INFERIOR MAXILLARY BONE OF A HUMAN EMBRYO IN THE MIDDLE OF THE EIGHTH MONTH (MONTHS OF FOUR WEEKS EACH).

Body-length, 15 inches.

Mental fossa Foveola mentalis

of canine tooth

Mental ossicles Ossicula mentalia

Mental fossa Foveola mentalis

FIG. 195.—MENTAL REGION OF A NEW-BORN BOY. THE LATERAL HALVES OF THE INFERIOR MAXILLARY BONE HAVE NOT YET UNITED; BETWEEN THEM ARE THE MENTAL OSSICLES. SEEN FROM BEFORE.

Mental protuberance Protuberantia mentalis Mental tubercle Tuberculum mentale

Fig. 196.—The fully developed Mental Protu-BERANCE, IN A CHILD AGED SIX AND A HALF THE MENTAL OSSICLES HAVE UNITED WITH EACH OTHER AND WITH THE LATERAL HALVES OF THE INFERIOR MAXILLARY BONE.

Mandibula-The inferior maxillary bone, lower jaw, or mandible.

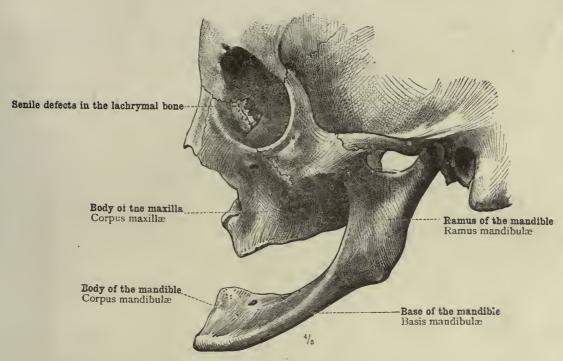


FIG. 197.—FACIAL PORTION OF THE SKULL OF A WOMAN AGED EIGHTY-FOUR YEARS, SHOWING ATROPHY OF THE ALVEOLAR PROCESSES OF THE SUPERIOR AND INFERIOR MAXILLARY BONES (NUTCRACKER FACE).

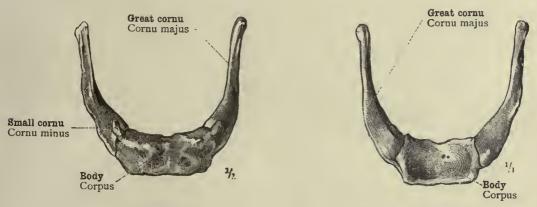


FIG. 198.—SEEN FROM ABOVE.

Fig. 199.—Seen from Below.

Os Hyoideum-The Hyoid Bone.

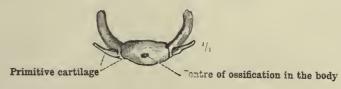


Fig. 200.—The Hyold Bone of a Boy, still-born at Full Term.

Body-length, 21 inches.

Senile atrophy of the jaws: Os hyoideum—the hyoid bone.

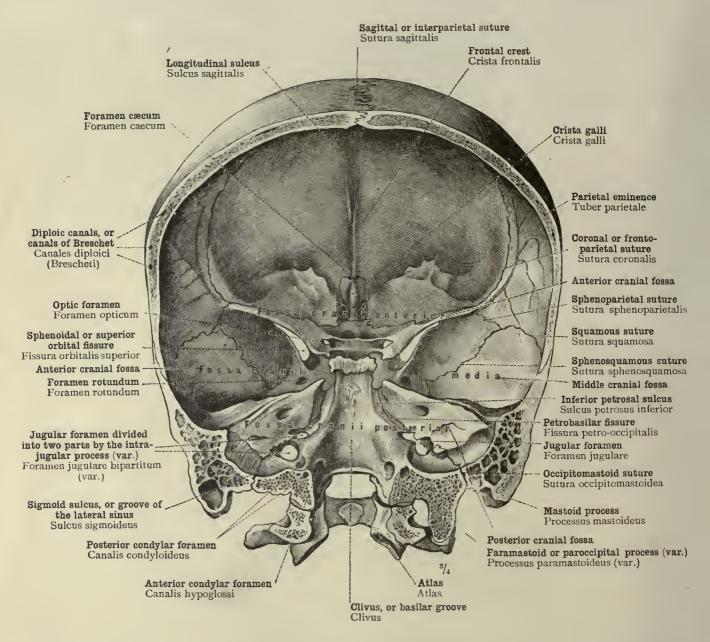


Fig. 201.—Skull divided into an Anterior and a Posterior Portion by a Frontal Section passing through the Mastoid Processes. The First Cervical Vertebra has also been divided by the Section, and left attached to the Skull.

View of the Anterior Portion of the Cranial Cavity. The Anterior and Middle Cranial Fossæ, as well as the Anterior Portion of the Postfrior Cranial Fossa, seen from Behind. On the Right Side is a Paramastoid Process articulating with the Atlas.

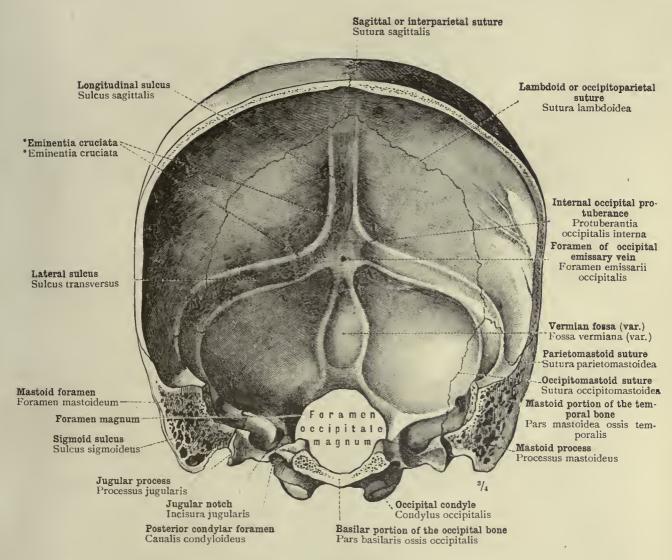
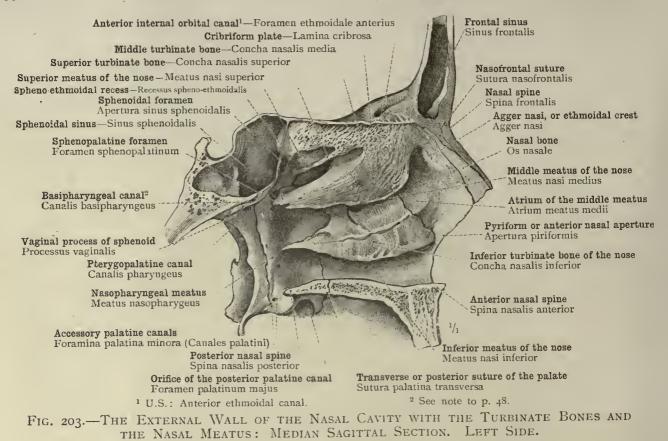


Fig. 202.—Skull divided into an Anterior and a Posterior Portion by a Frontal Section passing through the Mastoid Processes and the Basilar Portion of the Occipital Bone. View of the Posterior Portion of the Cranial Cavity. The Division of the Longitudinal Sulcus into Right Lateral and Left Lateral Sulcus is shown. The Lateral Sulcus passes on either Side into the Sigmoid Sulcus, which terminates in the Jugular Foramen.



Orifice of the ethmoidal cells Line of detachment of the middle turbinate bone of the nose Superior turbinate bone-Concha nasalis superior Spheno-ethmoidal recess—Recessus spheno-ethmoidalis Frontal sinus Sphenopalatine foramen Sinus frontalis Foramen sphenopalatinum Sulcus olfactorius Basipharyngeal canal<sup>1</sup> Sulcus olfactorius Canalis basipharyng us Vaginal process of sphenoid Processus vaginalis Agger nasi, or ethmoidal crest Agger nasi Orifice of the frontal sinus Apertura sinus frontalis Hiatus semilunaris Hiatus semilunaris infundibi li Pterygopalatine canal Ethmoidal bulla Canalis pharyngeus Bulla ethmoidalis Lachrymal hone—Os lacrimale Sphenoidal process Processus sphenoidalis Uncinate process Processus uncinatus Lachrymoturbinal suture Sutura lacrimoconchalis Lachrymal process of the inferior turbinate bone Orbital process Processus lacrimalis conchæ inferioris Processus orbitalis Vertical plate of the palate bone Inferior turbinate bone Pars perpendicularis ossis palatini Concha nasalis inferior Orifice of the maxillary sinus, or antrum of Highmore Inferior meatus of the nose Apertura sinus maxillaris Meatus nasi inferior Horizontal plate of the palate hone Palatine process of superior maxillary hone Pars horizontalis ossis palatini Processus palatinus maxillæ

<sup>1</sup> See note to p. 48.

Ethmoidal process of the inferior turbinate bone Processus ethmoidalis conchæ inferioris

Fig. 204.—The External Wall of the Nasal Cavity: Median Sagittal Section. Left Side.

The middle turbinate bone of the nose has been cut away.

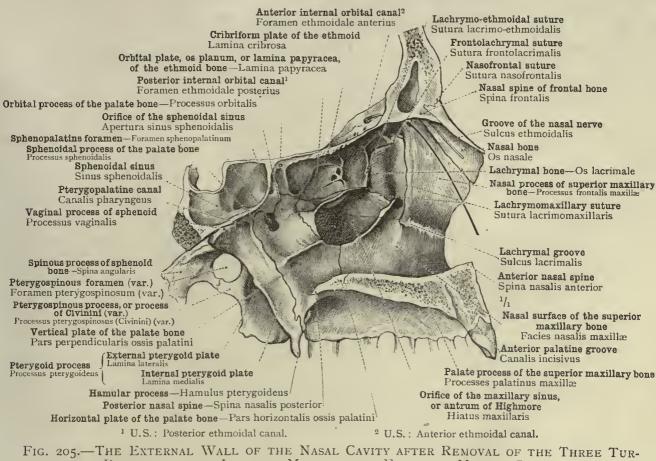


FIG. 205.—THE EXTERNAL WALL OF THE NASAL CAVITY AFTER REMOVAL OF THE THREE TURBINATE BONES AND THE LATERAL MASS OF THE ETHMOID: MEDIAN SAGITTAL SECTION. LEFT SIDE.

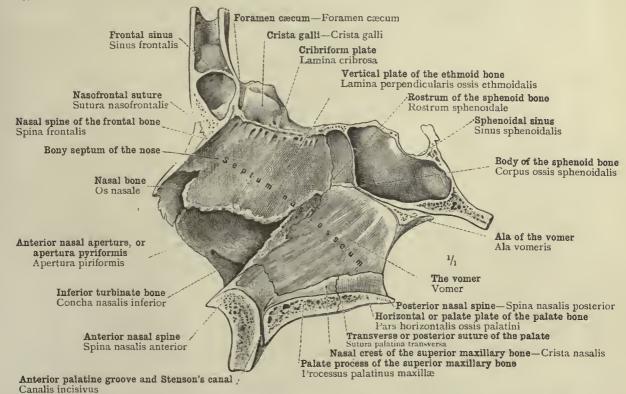
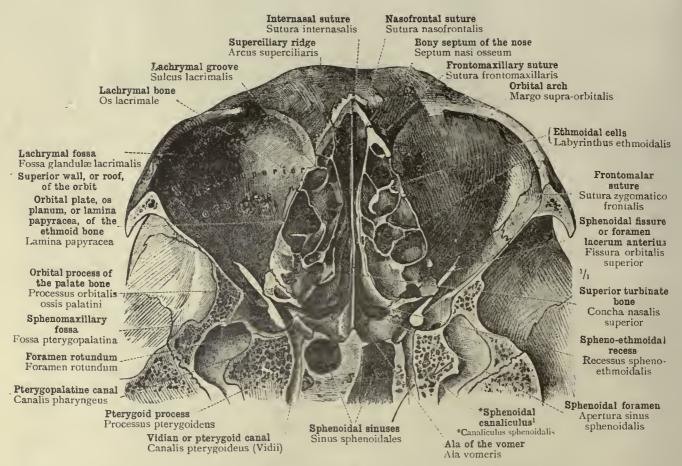


Fig. 206.—The Bony Septum of the Nose seen from the Left Side: Sagittal Section of the Facial Part of the Skull, a Little to the Left of the Median Plane.

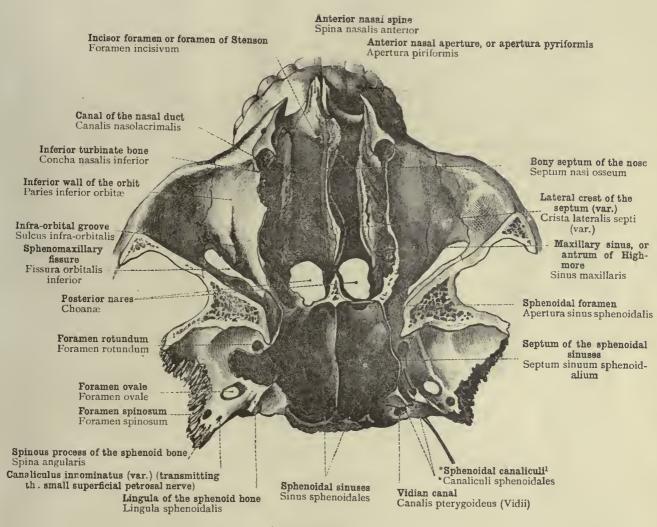


¹ I am indebted to Professor Toldt for the following account of the \*Sphenoidal canaliculus, which is accurately described neither by Quain nor by Macalister: "It begins in the scaphoid fossa and divides as it ascends into two branches, the inner of which opens into the Vidian canal, while the outer opens on the cerebral surface of the great wing of the sphenoid bone, between the lingula of the sphenoid bone and the foramen ovale." The outer branch is termed by English anatomists the foramen of Vesalius, and transmits an emissary vein: the inner branch gives passage to the sphenoidal branch of the otic ganglion, by means of which this ganglion communicates with the Vidian nerve.—Tr.

Fig. 207.—By Means of a nearly Horizontal Section passing through the Centre of the Entrance to the Orbit, the Upper Parts of the Nasal Fossæ and of the Orbits are displayed. Seen from Below.

Posteriorly the section passes through the body of the sphenoid bone and the root of the pterygoid process, opening up the Vidian canal through its whole length. A bristle has been passed into the \*sphenoidal canaliculus¹ from the Vidian canal. The lateral masses of the ethmoid bone (ethmoidal labyrinths) are divided in the horizontal plane.

Cavum nasi et orbita—The nasal fossæ and the orbits.



1 See note to p. 92.

FIG. 208.—By Means of a nearly Horizontal Section in a Plane a Little above that of the Inferior Walls of the Orbits, the Lower Portions of the Nasal Fossæ and of the Orbits have been exposed. Seen from Above.

Posteriorly the section passes through the sphenoidal sinuses, in this specimen exceptionally capacious. The upper orifices of the \*sphenoidal canaliculus (see note to p. 92) are indicated by bristles.

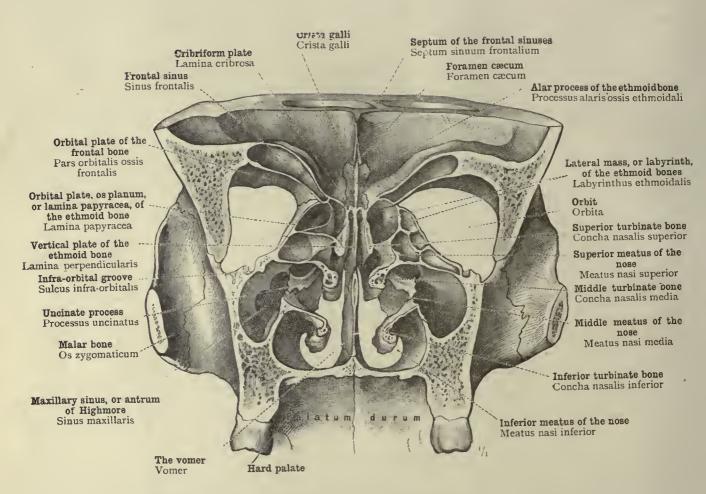


Fig. 209.—By Means of a Section passing through the most Anterior Portions of Both Zygomatic Arches, the Nasal Cavity and the Orbits are divided towards their Posterior Extremities in the Frontal Plane.

The anterior portion of the skull thus divided is figured from behind. The three turbinate bones of the nose and the three nasal meatus, as well as the bony septum of the nose, are seen in frontal section. The maxillary sinuses are also opened up, and the communication of these sinuses with the general cavity of the nose is to be seen above the uncinate process.

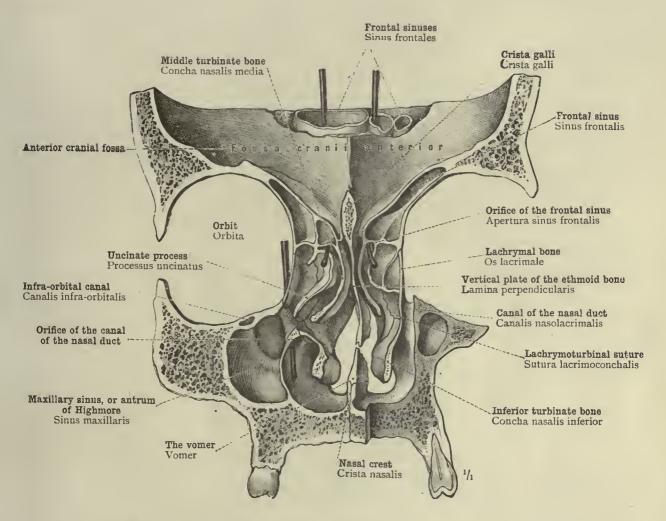
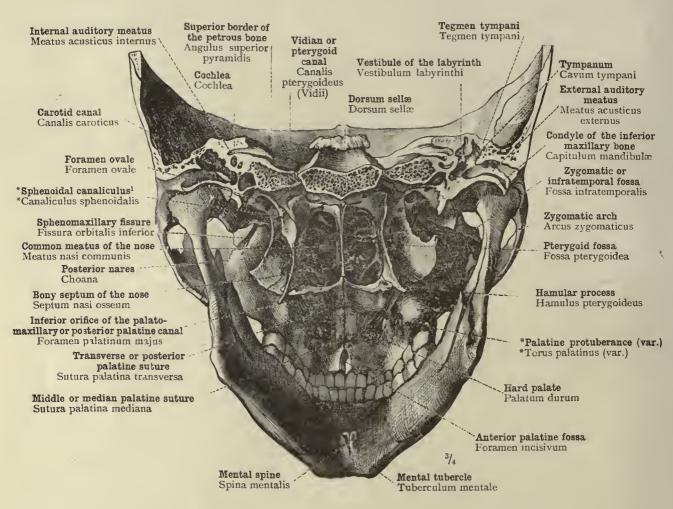


Fig. 210.—By Means of a Section passing vertically through the Posterior Portions of Both Lachrymal Bones, the Anterior Portion of the Nasal Cavity and of the Orbits is displayed in Frontal Section. Seen from Behind.

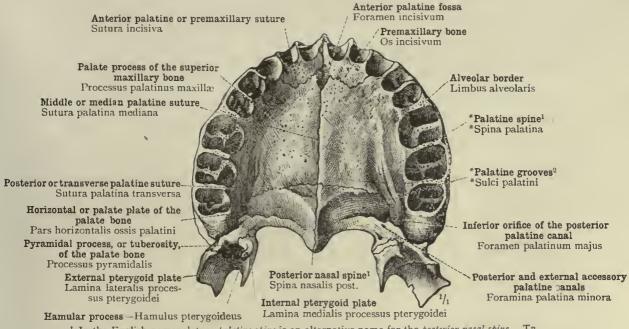
From the right side of the anterior portion of the skull thus divided, a layer of bone a quarter of an inch in thickness has been removed by a section in a plane parallel with the first section, so as to open up the canal of the nasal duct, canalis nasolacrimalis, in its entire length. The sounds passed into the two frontal sinuses indicate the orifices of these sinuses in the nasal fossæ. A third sound has been passed through the left canal of the nasal duct from the orbit into the nasal cavity.



1 See note to p. 92.

FIG. 211.—Anterior Portion of the Skull, separated from the Posterior Portion by A Frontal Section passing through the Two External Auditory Meatus.

The view from behind shows the posterior nares with the posterior border of the bony septum of the nose, the bony framework of the oral cavity, and the zygomatic fossæ; further, in frontal section, the tympanic cavities, with portions of the bony labyrinths and the internal auditory meatus.



<sup>1</sup> In the English nomenclature palatine spine is an alternative name for the posterior nasal spine.—Tr.

<sup>2</sup> The English nomenclature recognises one palatine groove only, that running forwards on the under surface of the hard palate from the inferior orifice of the posterior palatine canal, lodging the large palatine nerve and vessels.—Tr.

Fig. 212.—The Hard Palate, Palatum Durum, with the Alveolar Process of the Superior Maxillary Bone, removed by a Section passing horizontally through both Superior Maxillary Bones above the Floor of the Nasal Fossæ. Seen from Below.

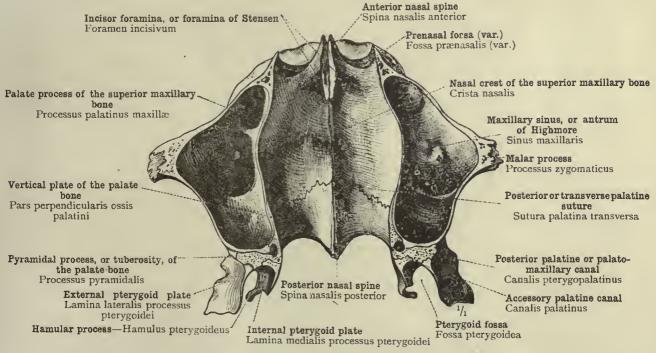


FIG. 213.—THE FLOOR (INFERIOR WALL) OF THE NASAL FOSSÆ WITH THE MAXILLARY SINUSES LYING ON EITHER SIDE, SHOWN BY MEANS OF A HORIZONTAL SECTION THROUGH THE SUPERIOR MAXILLARY BONES. SEEN FROM ABOVE.

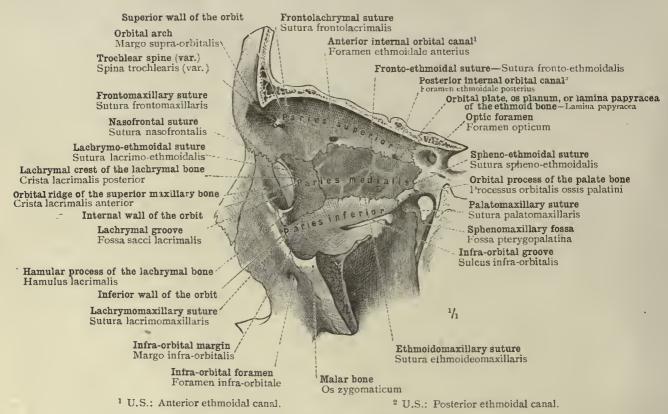


Fig. 214.—Internal Portion of the Left Orbit, shown by the Removal of the External Wall. Seen from the Left Side.

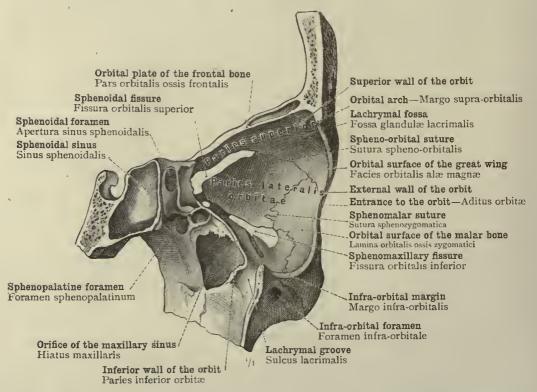


Fig. 215.—External Portion of the Left Orbit, shown by the Removal of the Internal Wall of the Orbit and of a Portion of the Superior Maxillary Bone in a longitudinally hemisected Skull.

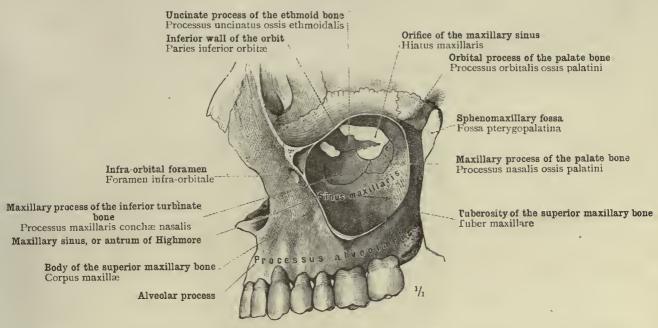


FIG. 216 .- THE LEFT MAXILLARY SINUS, OR ANTRUM OF HIGHMORE, SHOWN BY THE REMOVAL OF THE EXTERNAL WALL OF THE BODY OF THE SUPERIOR MAXILLARY BONE AND THE MALAR BONE. SEEN FROM THE LEFT SIDE.

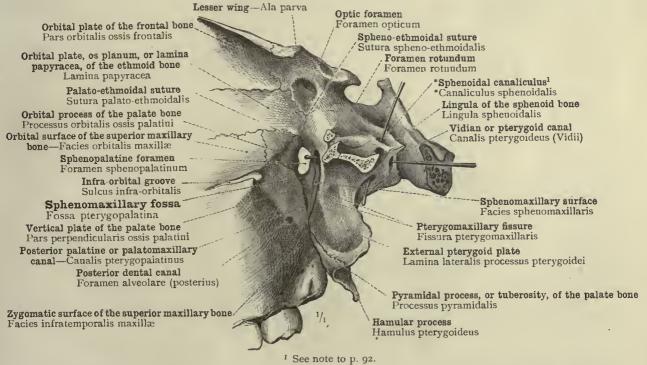


FIG. 217.—THE LEFT SPHENOMAXILLARY FOSSA, SHOWN BY REMOVAL OF THE MALAR BONE, THE TEMPORAL BONE, AND THE GREAT WING OF THE SPHENOID BONE. SEEN FROM THE LEFT SIDE.

A sound has been passed through the Vidian canal, and another through the \*sphenoidal canaliculus1 (exceptionally large in this specimen).

Sinus maxillaris—Maxillary sinus, or antrum of Highmore.—Fossa pterygopalatina—Sphenomaxillary fossa.

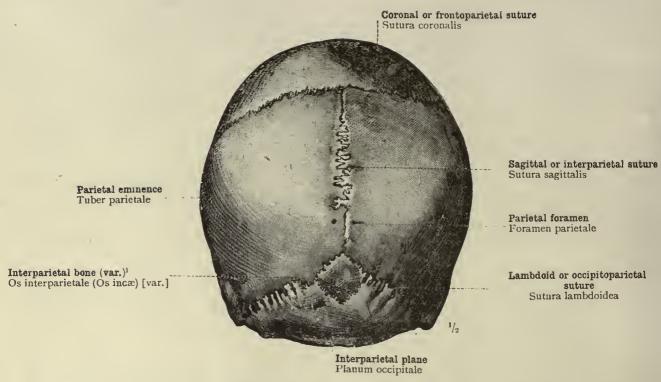


FIG. 218.—A LARGE WORMIAN BONE IN THE UPPERMOST PART OF THE LAMBDOID SUTURE.

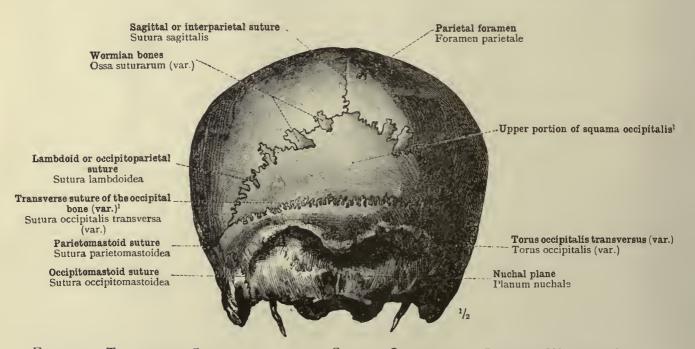


Fig. 219.—Transverse Subdivision of the Squama Occipitalis. Several Wormian Bones in the Lambdoid Suture.

1 See note to p. 57.

Ossa suturarum-Wormian bones.

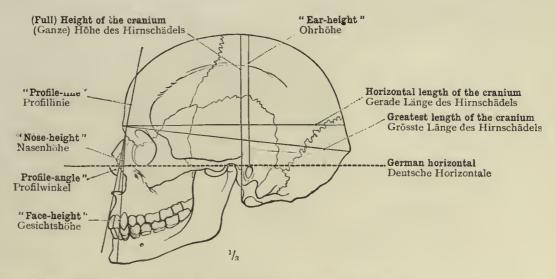
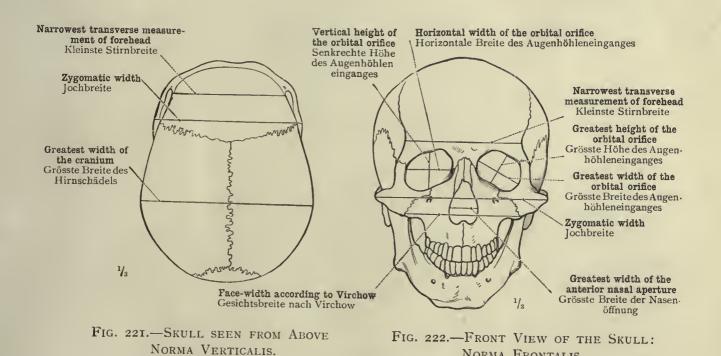


FIG. 220.—SIDE-VIEW OF THE SKULL: NORMA LATERALIS.



TRANSLATOR'S NOTE.—The above measurements do not fully correspond with those used by English craniologists. For this reason a purely literal translation of the German terms has been given.

NORMA FRONTALIS.

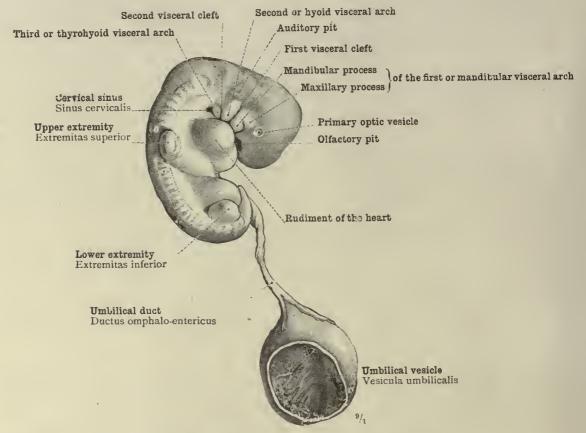


FIG. 223.—HUMAN EMBRYO, FOUR WEEKS OLD.
The umbilical vesicle has been opened.

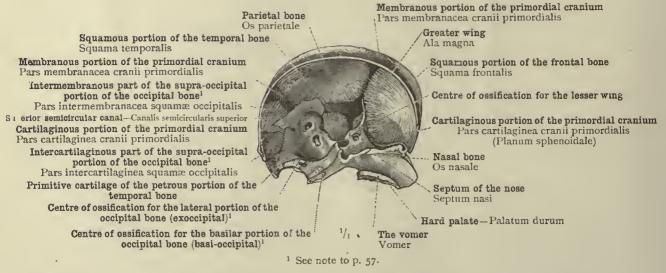


Fig. 224.—The Left Half of the Skull of a Human Fætus at the End of the Fourth Month (Months of Four Weeks Each). Seen from Within. The Cartilaginous Portion of the Primordial Cranium (Chondrocranium) is coloured Blue.

Body-length, 4½ inches.

Development of the Skull.

Squamous portion of the temporal bone Squama temporalis Cartilaginous bar of the mandibular or first visceral arch (Meckel's cartilage) The incus Mandible Incus Mandibula Cartilaginous portion of the primordial cranium 1/1 Pars cartilaginea cranii primordialis The malleus Cartilaginous bar of the hyoid or second Mallens visceral arch (primitive cartilage of the styloid process) Tympanic ring Annulus tympanicus

FIG. 225.—THE SQUAMOUS PORTION OF THE TEMPORAL BONE, THE TYMPANIC MEMBRANE WITH THE MALLEUS, THE INCUS, AND MECKEL'S CARTILAGE, FROM A HUMAN FŒTUS IN THE FIRST HALF OF THE FIFTH MONTH (MONTHS OF FOUR WEEKS EACH). SEEN FROM WITHIN.

Body-length, 51 inches.

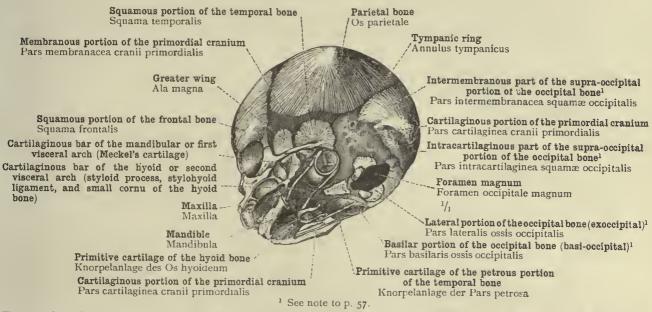


FIG. 226.—THE SKULL OF A HUMAN FŒTUS IN THE MIDDLE OF THE FIFTH MONTII (MONTHS OF FOUR WEEKS EACH). SEEN FROM THE LEFT SIDE AND BELOW.

Body length,  $6\frac{1}{2}$  inches. The cartilaginous bars of the viscoral arches are displayed, and these, together with the cartilaginous portion of the primordial cranium, are coloured blue. Part of the cartilage of the left side of the inferior maxilla has been removed in order to lay bare a portion of Meckel's cartilage which lies beneath it.



Fig. 227.—The Dried Skull of a Human Fœtus in the Middle of the Fourtii Month (Months of Four Weeks Each).

Body-length, 3½ inches.



FIG. 228.—THE DRIED SKULL OF A HUMAN FŒTUS AT THE END OF THE SIXTH MONTH (MONTHS OF FOUR WEEKS EACH).

Body-length, 111 inches.

Development of the Skull.

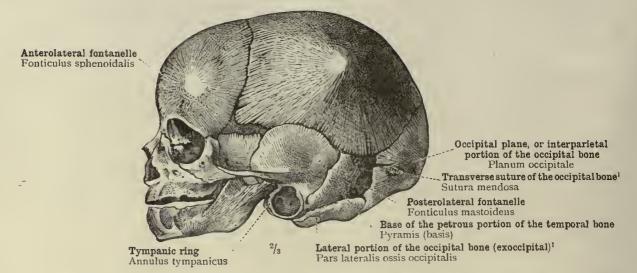
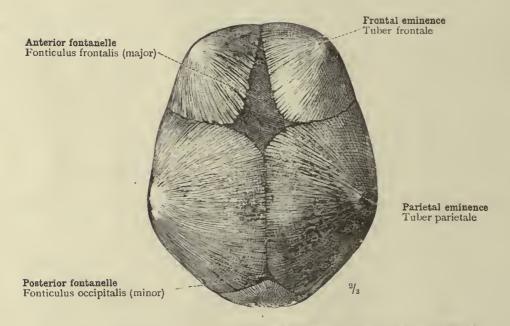


Fig. 229.—The Dried Skull of an Infant born at Full Term. Seen from the Left Side.

Body-length, 20½ inches. In the anterolateral fontanelle there remains part of the membranous portion of the primordial cranium (membrane of the fontanelle); in the posterolateral fontanelle there remains part of the cartil-ginous portion of the primordial cranium.



Supra-occipital portion of the occipital bone<sup>1</sup> Squama occipitalis

FIG. 230.—THE DRIED SKULL OF AN INFANT BORN AT FULL TERM. SEEN FROM ABOVE.

Body-length, 20½ inches. In the anterior and in the posterior fontanelle there remain parts of the membranous portion of the primordial cranium.

1 See note to p. 57.

Development of the Skull.

## SKELETON EXTREMITATUM, SUPERIORIS ET INFERIORIS

THE SKELETON OF THE UPPER AND LOWER EXTREMITIES

(THE APPENDICULAR SKELETON)

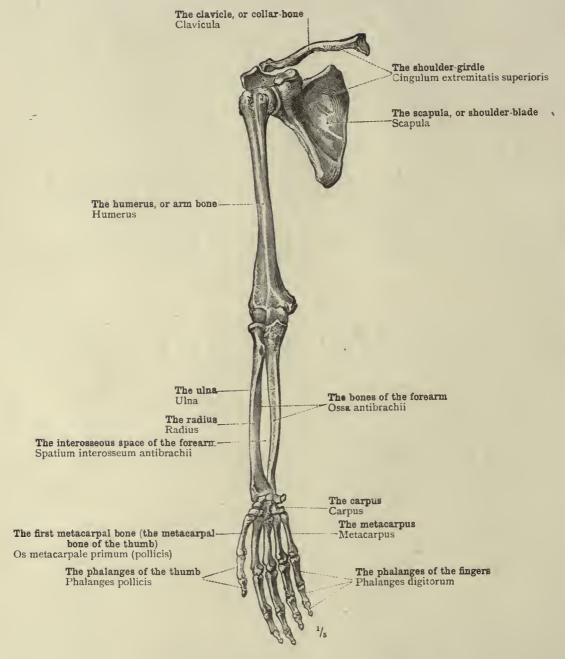


FIG 231.—THE SKELETON OF THE UPPER EXTREMITY.

Skeleton extremitatis superioris—The skeleton of the upper extremity.

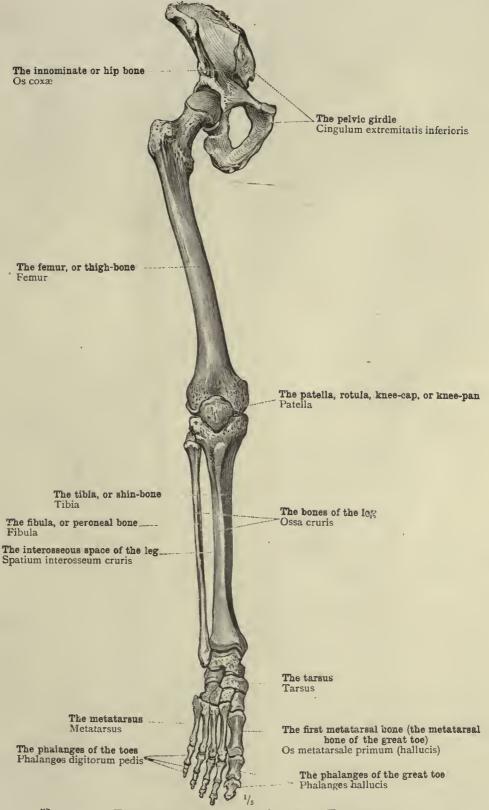


Fig. 232.—The Skeleton of the Lower Extremity.

Skeleton extremitatis inferioris—The skeleton of the lower extremity.

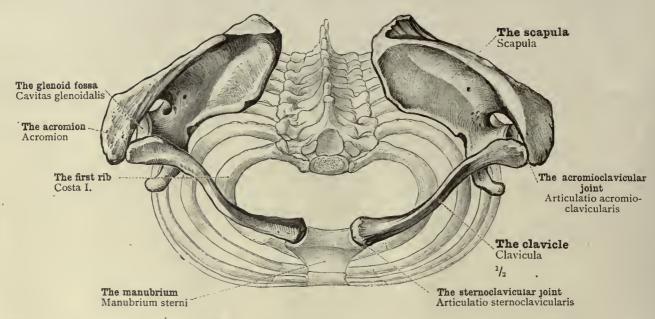


Fig. 233.—The Shoulder-Girdle and its Relation to the Thorax. Seen from Above.

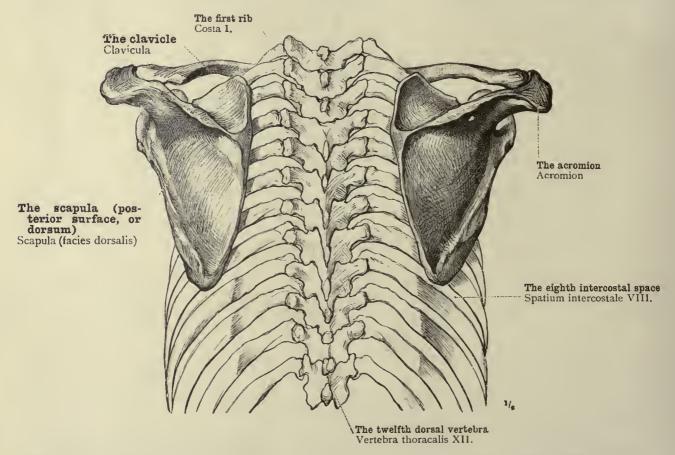


Fig. 234.—The Shoulder-Girdle and its Relation to the Thorax. Seen from Behind.

Cingulum extremitatis superioris—The shoulder-girdle.



FIG. 235.—THE RIGHT CLAVICLE SEEN FROM ABOVE.



Fig. 23 .—The Right Clavicle seen from Below.

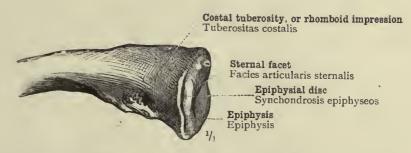


Fig. 237.—Sternal Extremity of the Right Clavicle of a Female aged Twenty Years, with a Sternal Epiphysis. Seen from Before.

Clavicula-The clavicic.

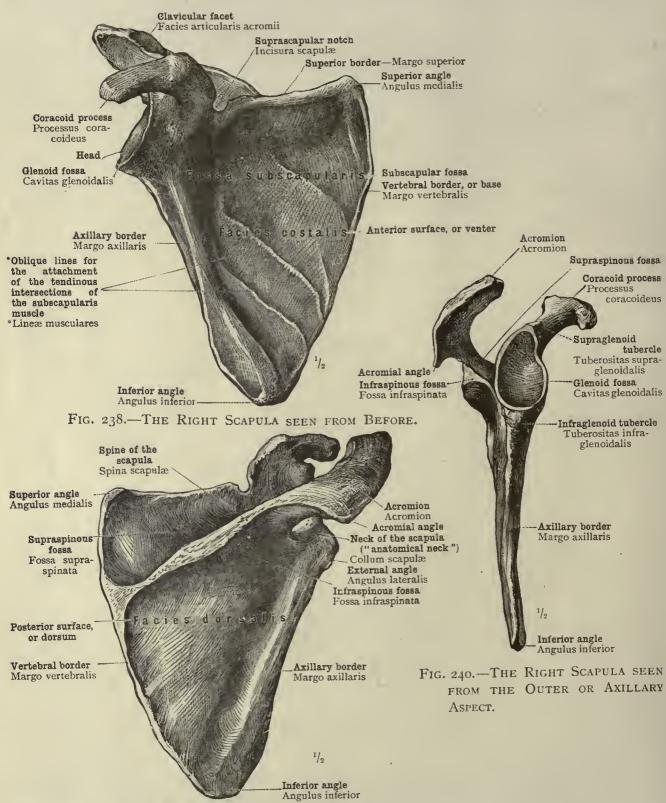


Fig. 239.—The Right Scapula seen from Behind.

Scapula—The shoulder-blade.

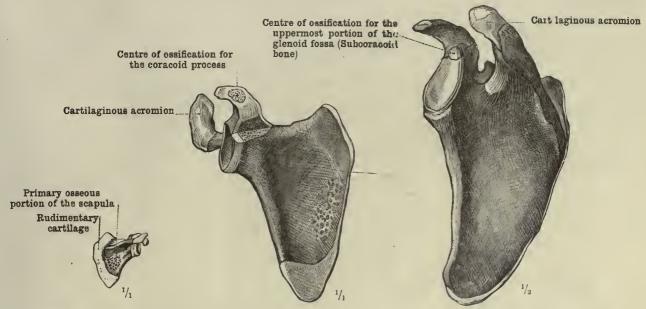


FIG. 241.—IN THE FIFTH MONTH OF INTRA-UTERINE LIFE (MONTHS OF FOUR WEEKS EACH).

Fig. 242.—In the Second Year of Life.

Fig. 243.—In the Fifteenth Year of Life.

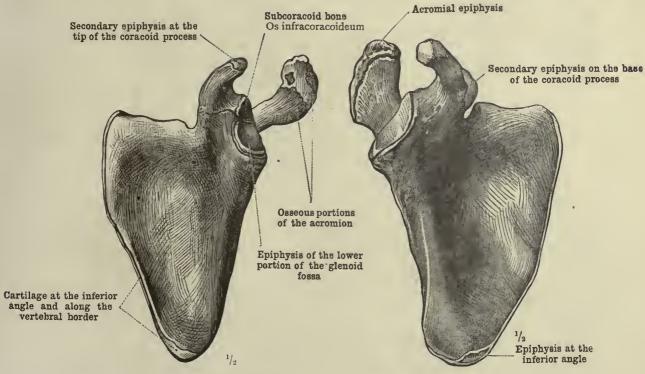


Fig. 244.—In the Seventeenth Year of Life.

Fig. 245.—In the Nineteenth Year of Life.

Development of the Scapula.

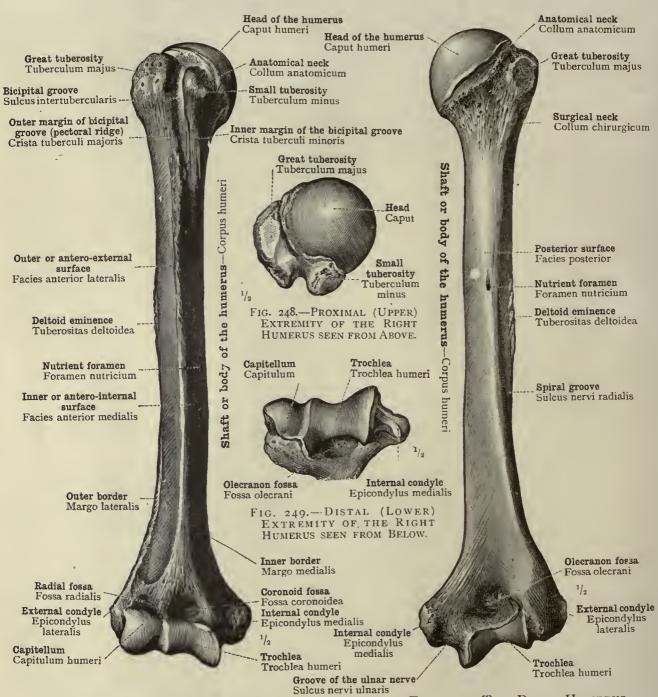


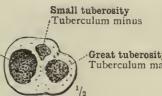
Fig. 246.—The Right Humerus seen from Before.

FIG. 247.—THE RIGHT HUMERUS SEEN FROM BEHIND.

Centre of ossification in the head of the humerus



Centre of ossification in the head of the humerus



Great tuberosity Tuberculum majus

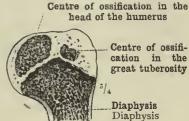


FIG. 251.—FROM A BOY AGED TWO YEARS.

FIG. 250.—FROM A GIRL AGED FOUR MONTHS.

FIG. 252.—FROM A BOY AGED THREE YEARS (HORIZONTAL SECTION.)

THE CENTRES OF OSSIFICATION OF THE PROXIMAL EXTREMITY OF THE HUMERUS.

Common epiphysis of the proximal extremity Epiphysis proximalis communis Epiphysial disc Synchondrosis





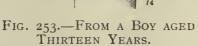




Fig. 254.—From a Girl aged NINETEEN YEARS.

THE COMMON EPIPHYSIS OF THE PROXIMAL EXTREMITY OF THE HUMERUS.



Centre of ossification in the capitellum of the humerus

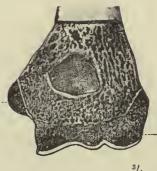
Fig. 255.—From a Boy aged Two and a Half Years.

Olecranon fossa Fossa olecrani Centre of ossification of the internal condyle Centre of ossification of the trochlea



Epiphysis of the internal condyle

Centre of ossification of the capitellum



Common epiphysis of the distal extremity Epiphysis distalis communis

Fig. 256.—From a Boy aged THIRTEEN YEARS.

FIG. 257.—FROM A BOY AGED SEVENTEEN YEARS.

THE EPIPHYSES OF THE DISTAL EXTREMITY OF THE HUMERUS.

Development of the Humerus.

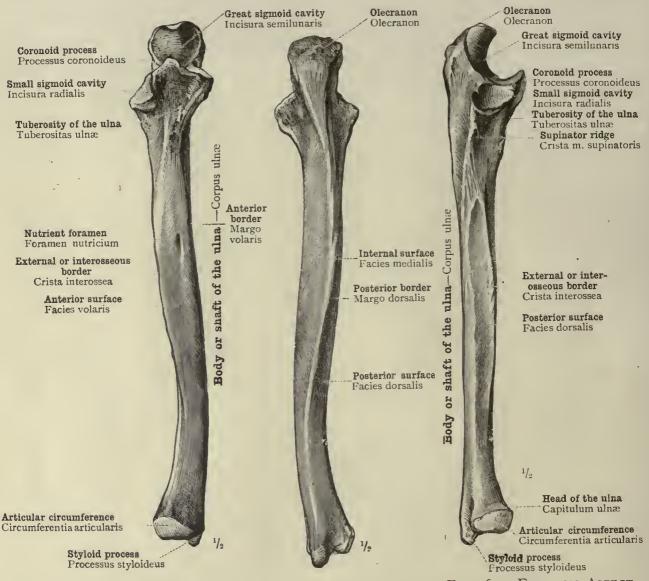


Fig. 258.—Anterior Aspect. Fig. 259.—Posterior Aspect. The Ulna of the Right Side.

FIG. 260.—EXTERNAL ASPECT.

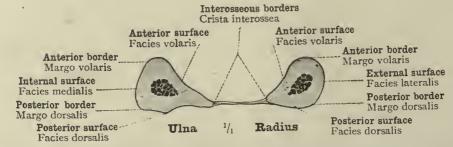


FIG. 261.—TRANSVERSE (HORIZONTAL) SECTION THROUGH THE MIDDLE OF THE ULNA AND THE RADIUS, WITH THE INTEROSSEOUS MEMBRANE, IN SUPINATION.

Ossa antibrachii-The bones of the forearm.

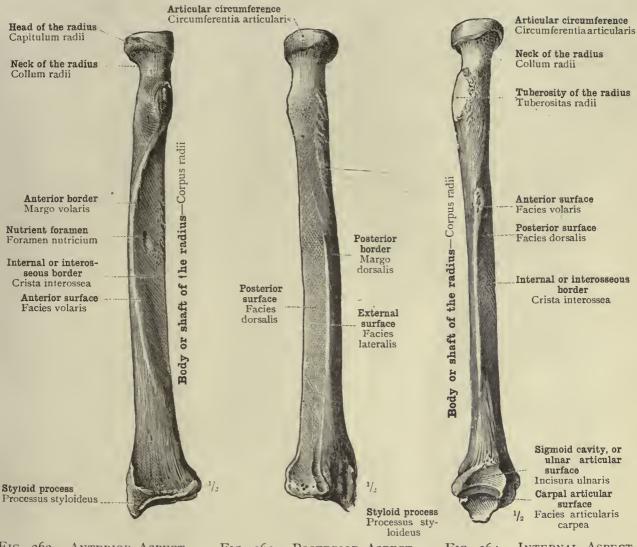


Fig. 262.—Anterior Aspect.

Fig. 263.—Posterior Aspect.
The Radius of the Right Side.

FIG. 264.—INTERNAL ASPECT.



Fig. 265.—The Proximal Extremities of the Bones of the Right Fore-ARM SEEN FROM ABOVE. Fig. 266.—The Distal Extremities of the Bones of the Right Forearm seen from Below.

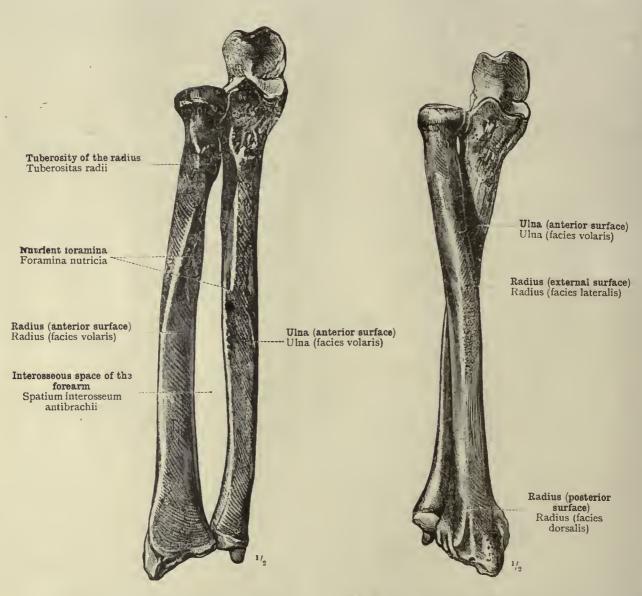


Fig. 267.—The Bones of the Right Forearm, in Supination.

Fig. 268.—The Bones of the Right Forearm, in Pronation.

The Bones of the Forearm in Supination and Pronation.



Centres of ossification in the olecranon



Double epiphysis of the olecranon in the act of uniting with the shaft

FIG. 269.—FROM A BOY AGED THIRTEEN YEARS.

FIG. 270.—FROM A BOY AGED SEVENTEEN YEARS.

THE DEVELOPMENT OF THE EPIPHYSIS OF THE PROXIMAL EXTREMITY OF THE ULNA.

Tuberositas ulnæ

Centre of ossification in the head of the ulna



FIG. 271.—FROM A GIRL AGED SIX YEARS.



Epiphysis of the head of the ulna in the act of uniting with the shaft

FIG. 272.—FROM A YOUNG MAN AGED NINETEEN YEARS.

THE DEVELOPMENT OF THE EPIPHYSIS OF THE DISTAL EXTREMITY OF THE ULNA.

Centre of ossification in the head of the radius



Epiphysis of the head of the radius in the act of uniting with the

> Tuberosity of the radius Tuberositas radii

FIG. 273.—FROM A BOY AGED FIVE YEARS. FIG. 274.—FROM A BOY AGED SEVENTEEN YEARS.

THE DEVELOPMENT OF THE EPIPHYSIS OF THE PROXIMAL EXTREMITY OF THE RADIUS.

Centre of ossification in the distal extremity of the radius



FIG. 275.—FROM A GIRL AGED Two YEARS.



Distal epiphysis of the radius in the act of uniting with the shaft

FIG. 276.—FROM A YOUNG MAN AGED NINETEEN YEARS.

THE DEVELOPMENT OF THE EPIPHYSIS OF THE DISTAL EXTREMITY OF THE RADIUS.

Development of the Bones of the Forearm.

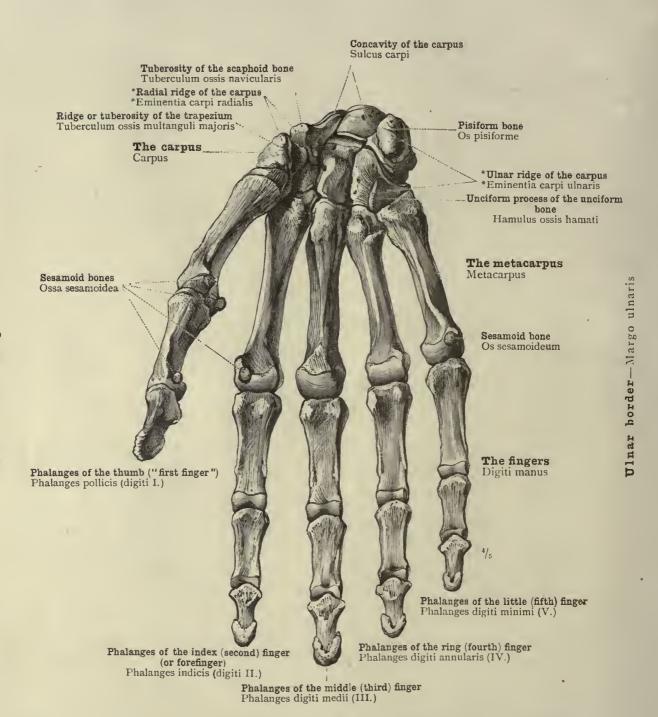


Fig. 277.—Palmar Aspect of the Skeleton of the Right Hand (Facies Volaris).

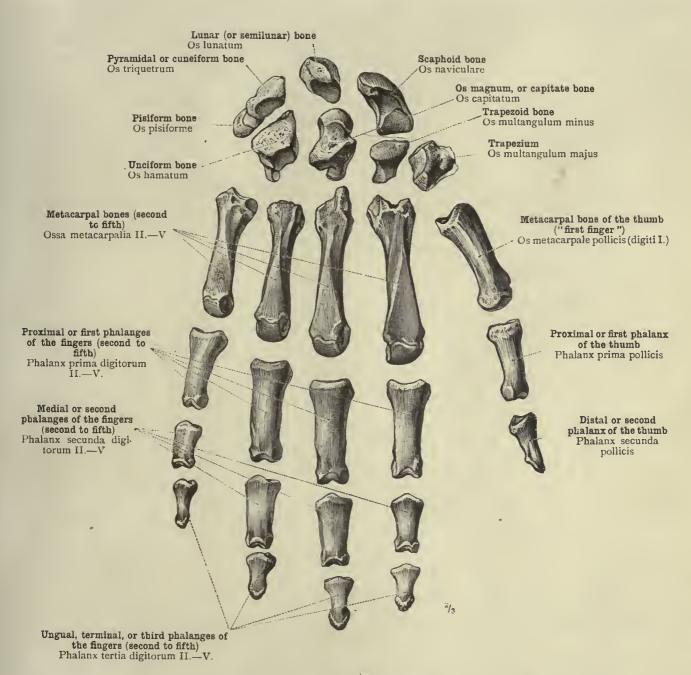


Fig. 278.—Dorsal Aspect of the Bones of the Right Hand seen from the Dorsal Side (Facies Dorsalis).

Skeleton manus—The skeleton of the hand,

Dorsal transverse ridge Articular facet for the os magnum

> Articular facet for the lunar bone



Tuberosity of the scaphoid Tuberositas

Articular facet for the radius

Dorsal transverse ridge for ligaments Articular facet for the

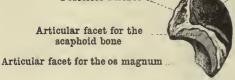
trapezoid bone Articular facet for the trapezium

Fig. 279.—DISTAL ASPECT.

Fig. 280.—Posterior Aspect.

OS NAVICULARE MANUS—THE RIGHT SCAPIIOID BONE.

Posterior surface-



Articular facet for the radius

> Articular facet for the pyramidal or cuneiform bone



Articular facet for the os magnum Articular facet for the unciform bone 1/1 Palmar surface

FIG. 281.—RADIAL ASPECT.

FIG. 282.—ULNAR ASPECT.

Os Lunatum—The Right Lunar (or Semilunar) Bone.

Posterior surface

Articular facet for the unciform bone



Articular facet for the lunar bone

Articular facet for the pisiform bone



Fig. 283.—Radial Aspect.

FIG. 284.—PALMAR ASPECT.

Os TRIQUETRUM—THE RIGHT PYRAMIDAL OR CUNEIFORM BONE.



Articular facet for the pyramidal or cuneiform bone

FIG. 285.—PALMAR ASPECT.

Fig. 286.—Posterior Aspect.

Os Pisiforme—The Right Pisiform Bone.

Lunar (or semilunar) bone Os lunatum

Pyramidal or cuneiform bone Os triquetrum

> Pisiform bone Os pisiforme Unciform bone Os hamatum

Os magnum, or capitate bone

Scaphoid bone Os naviculare

Central boue of the carpus (var.) Os centrale carpi (var.)

Trapezoid bone Os multangulum minus

Trapezium Os multangulum majus

Os capitatum

FIG. 287. THE POSTERIOR ASPECT OF THE RIGHT CARPUS, CONTAINING AN OS CENTRALE.

Ossa carpi-The bones of the carpus: first, superior, or proximal row.

Articular facet for the second metacarpal bone

Groove for the tendon of the flexor carpi radialis muscle



Saddle-shaped articular facet for the metacarpal bone of the thumb

Tuberosity or ridge Tuberculum



Articular facet for the second metacarpal bone Articular facet for the trapezoid bone

Articular facet for the scaphoid bone

Fig. 288.—DISTAL ASPECT.

FIG. 289.—ULNAR ASPECT.

Os Multangulum Majus—The Right Trapezium.

Articular facet for the os magnum or capitate bone

Articular facet for the scaphoid bone



Radial articular facet for the second metacarpal bone

Ulnar articular facet for the second metacarpal bone



Posterior surface

Articular facet for the scaphoid bone Articular facet for trapezium

FIG. 290.—ULNAR ASPECT.

Fig. 291.—RADIAL ASPECT.

OS MULTANGULUM MINUS-THE RIGHT TRAPEZOID BONE.

Head Caput

Posterior surface
Articular facet for the
trapezoid bone



Anterior surface

Articular facet for the second metacarpal bone

Articular facet for the third metacarpal bone \_Head Caput

Articular facet for the unciform bone

1/1

Articular facet for the third metacarpal bone

FIG. 292.—RADIAL ASPECT.

FIG. 293.—ULNAR ASPECT.

OS CAPITATUM—THE RIGHT OS MAGNUM OR CAPITATE BONE.

Posterior surface-

Articular facet for the fourth metacarpal bone Articular facet for the fifthmetacarpal bone



Articular facet for the os magnum or capitate bone

Unciform process



Articular facet for the lunar (or semilunar) bone

> Articular facet for the pyramidal or cuneiform bone

Unciform process

Fig. 294.—DISTAL ASPECT.

FIG. 295.—PROXIMAL ASPECT.

Os HAMATUM—THE RIGHT UNCIFORM BONE.

Ossa-carpi—The bones of the carpus: second, inferior, or distal row.

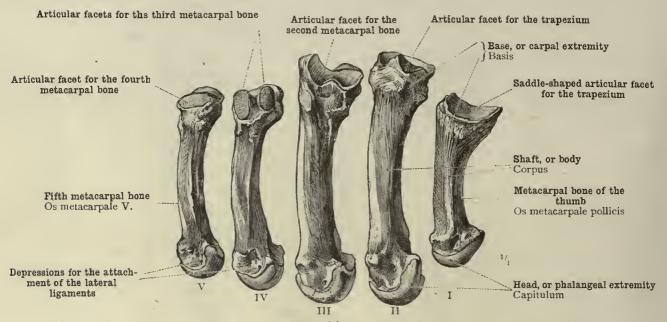


Fig. 296.—Radial Aspect of the Five Metacarpal Bones of the Right Hand.

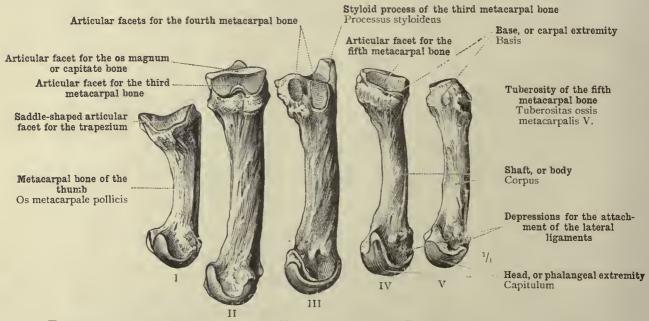


Fig. 297.—Ulnar Aspect of the Five Metacarpal Bones of the Right Hand.

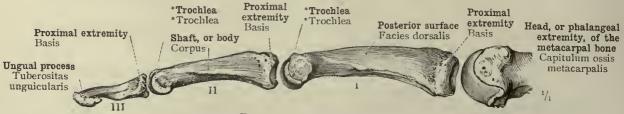


Fig. 298.—Radial Aspect of the Bones of the Right Index Finger (Margo Radialis Digiti Secundi).

The Metacarpal Bones of the Hand and the Phalanges of the Fingers.



Fig. 299.—In the Second Year of Life.

Lunar (or semilunar) bone
Os lunatum

Pyramidal or cuneiform bone
Os triquetrum

Unciform bone
Os hamatum

Os magnum, or capitate bone
Os capitatum

Scaphoid bone
Os naviculare
Os multangulum
majus

Os hamatum

Fig. 300.—In the Seventh Year of Life.

CENTRES OF OSSIFICATION OF THE CARPUS (SECTIONS PARALLEL TO THE POSTERIOR SURFACE).

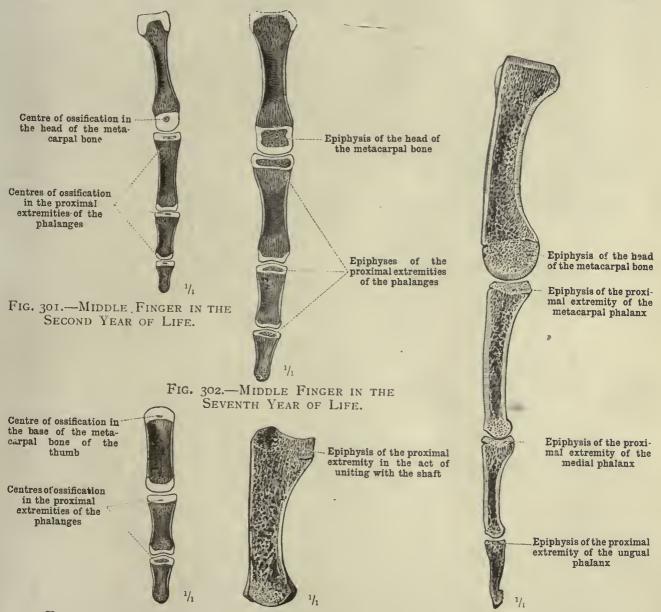


FIG. 304.—BONES OF THE THUMB IN THE FOURTH YEAR OF LIFE.

Fig. 305.—Metacarpal Bone of the Thumb in the Eighteenth Year of Life. FIG. 303.—EPIPHYSES OF THE BONES OF THE MIDDLE FINGER IN THE ACT OF UNITING WITH THE SHAFTS: SEVENTEENTH YEAR OF LIFE.

Development of the Bones of the Hand.

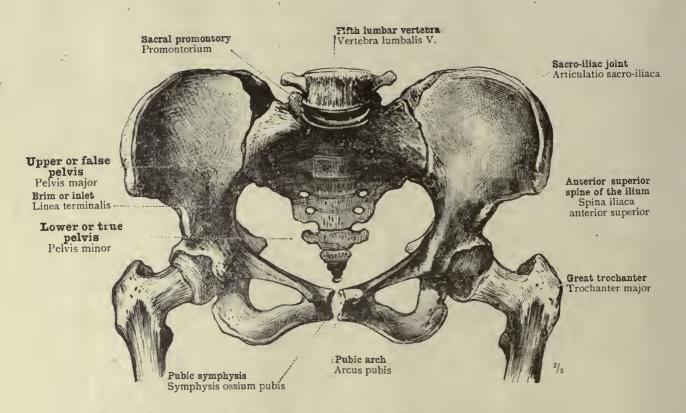


Fig. 306.—Pelvis Muliebris—The Female Pelvis. Anterior Aspect.

The formation of the pelvis out of the sacrum and coccyx and the two innominate bones. The iliac portions of the innominate bones with the base of the sacrum constitute the upper or false pelvis; the pubic and ischiatic portions of the innominate bones with the sacrum and the coccyx constitute the lower or true pelvis; the boundary between the false and the true pelvis corresponds with the upper aperture or entrance of the true pelvis, the line separating the two being known as the brim or inlet of the true pelvis. Regarded as the means of attachment of the lower limb to the trunk, the pelvis is the cingulum extremitatis inferioris, or pelvic girdle.

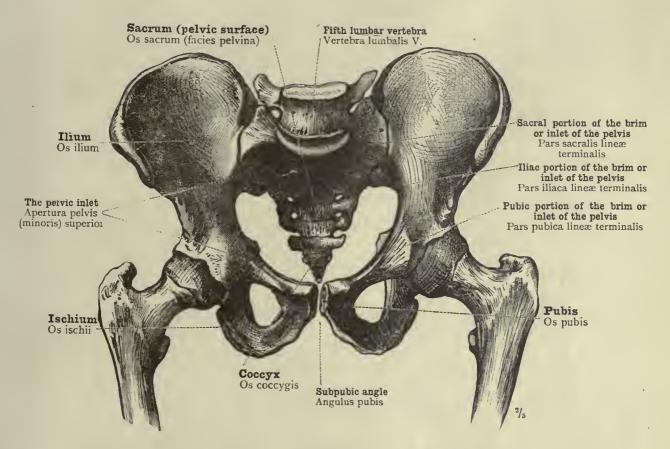


Fig. 307.—Pelvis Virilis—The Male Pelvis. Anterior Aspect.

The upper or false and the lower or true pelvis, pelvis major and pelvis minor. The brim of the true pelvis is divided into a sacral, an iliac, and a pubic portion.

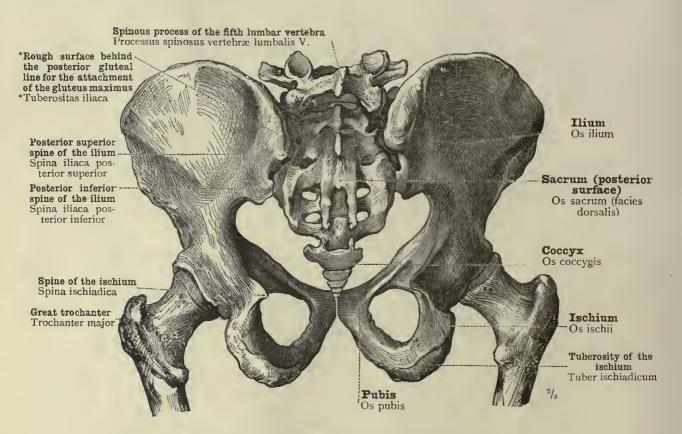


Fig. 308.—Pelvis Virilis—The Male Pelvis. Posterior Aspect.

The pelvic outlet, apertura pelvis (minoris) inferior, in the bony pelvis appears to be bounded on either side by the lower borders of the pubis and the ischium and the greater and lesser sciatic notches, incisuræ ischiadicæ major et minor, and behind by the projecting part of the sacrum and by the coccyx. But inasmuch as on either side there are two strong ligaments arising from the sacrum and coccyx, the great and the small sacrosciatic ligaments, ligamenta sacrotuberosum et sacrospinosum, which stretch across the two sciatic notches, and thus enlarge the posterior and lateral walls of the true pelvis, by this means the sciatic notches are filled in, and the outlet of the pelvis is notably diminished in size.

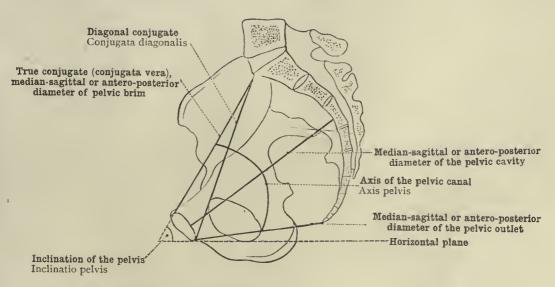


Fig. 309.—The Median-Sagittal or Antero-Posterior Diameters of the True Pelvis.

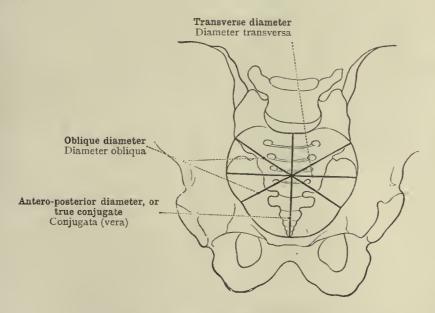
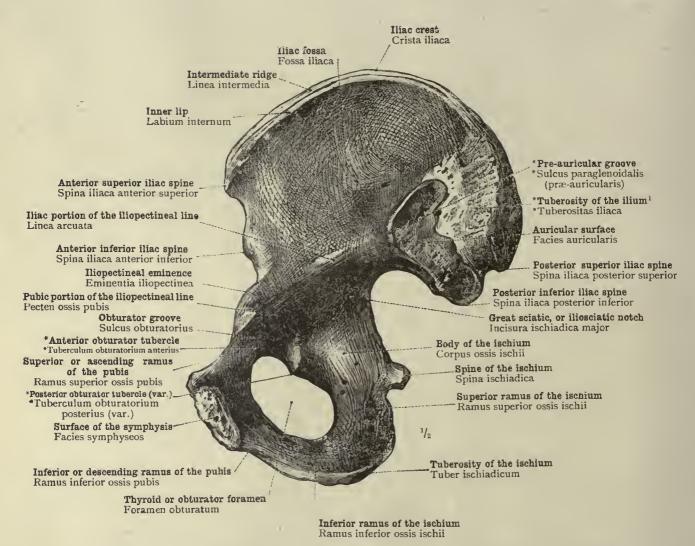


Fig. 310.—The Diameters of the Pelvic Inlet (Apertura Pelvis Superior).

The Principal Diameters of the True Pelvis.



<sup>1</sup> This term, which is seldom used by English anatomists, denotes the posterior fifth of the crest of the ilium and the rough surface of bone immediately below the crest on either side.—TR.

## FIG. 311.—THE RIGHT HIP-BONE. INNER ASPECT.

The ilium forms the upper part of the os innominatum. The slightly concave inner surface of the upper and anterior part of the ilium, known as the iliac fossa, is directed towards the observer; behind the fossa is the auricular surface for articulation with the sacrum; and behind the auricular surface is the internal rough surface of the \*tuberosity of the ilium. The upper border of the ilium is the iliac crest, the anterior extremity of which forms the anterior superior iliac spine, the posterior extremity, the posterior superior iliac spine. From the anterior border of the ilium projects the anterior iliac spine, from the posterior border, the posterior interior iliac spine. The superior or ascending and the inferior or descending ramus of the pubis and the superior and inferior ramus of the ischium, surrounding the obturator foramen, are all seen from the internal or pelvic aspect. The surface of the pubic symphysis, by means of which the two pubic bones articulate, forms the internal limiting surface of the os pubis.

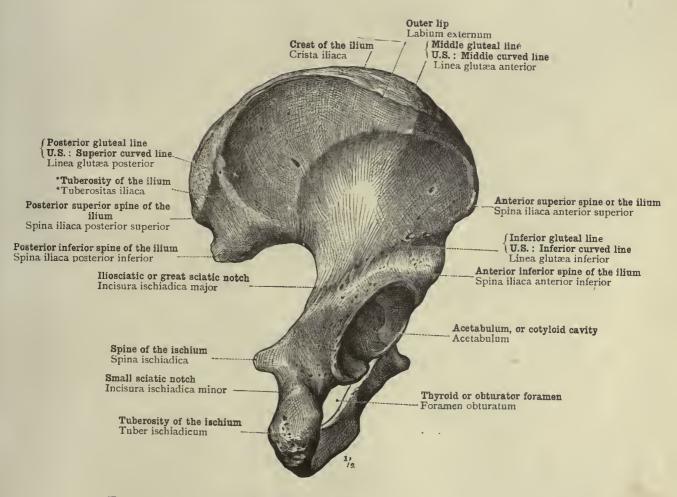
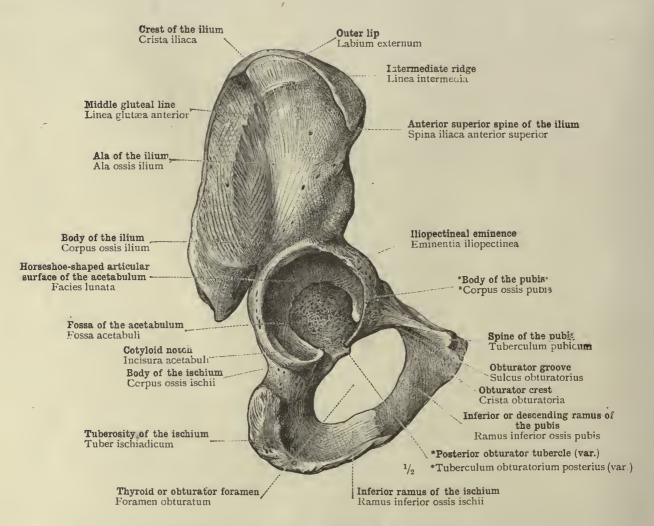


FIG. 312.—THE RIGHT HIP-BONE, OUTER SIDE. POSTERIOR ASPECT.

The outer surface of the ilium is seen, divided by the three gluteal lines into areas from which the three gluteal muscles respectively arise. The spine of the ischium projects backwards from the posterior border of the hip-bone; above this spine is the iliosciatic or great sciatic notch, below it is the small science notch. The lowest portion of the bone is formed by the backwardly projecting tuberceity of the ischium. The acetabulum is viewed obliquely from behind.



Body of the pubis: The use of this term by English anatomists is a variable one. Macalister, whose terminology here, as usual, is in conformity with that of Continental anatomists, writes: "The pubis consists of a body which forms a little less than one-fifth of the acetabulum . . . "; Quain, on the other hand, writes: "The flat portion between the rami [of the pubis] is the body"; and Young, in his "Synopsis of Human Anatomy" (U.S.), follows Quain's usage. The Continental application of the term has, however, the advantage in the point of consistency, the body being then, in the case of each of the three elements of the hip-bone, the thickened portion taking part in the formation of the acetabulum, of which the body of the tubis constitutes about one-fifth, the body of the ilium nearly two-fifths, and the body of the ischium the remainder.—Tr.

## Fig. 313.—The Right Hip-Bone, Outer Side. Seen from the Right.

For this illustration the hip-bone has been so placed that a direct view of the interior of the acetabulum is obtained; this consists of two portions, the rough, nearly circular fossa of the acetabulum, and the horse-shoe shaped articular surface (facies lunata—covered in the recent state with cartilage); opposite the fossa of the acetabulum, the rim bounding the depression is interrupted by the cotyloid notch (incisura acetabuli). The three bones which, separate at first, subsequently unite to form the hip-bone, all take part in the formation of the acetabulum (see note 1 above).

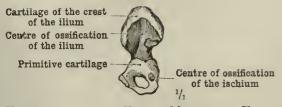


FIG. 314.—IN THE FIFTH MONTH OF FŒTAL LIFE (MONTHS OF FOUR WEEKS EACH).



FIG. 315.—IN THE SIXTH MONTH OF FŒTAL LIFE (MONTHS OF FOUR WEEKS EACH).

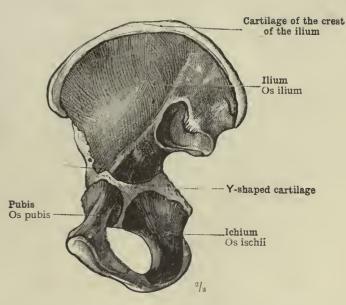


Fig. 316.—In the Fourth Year of Life.

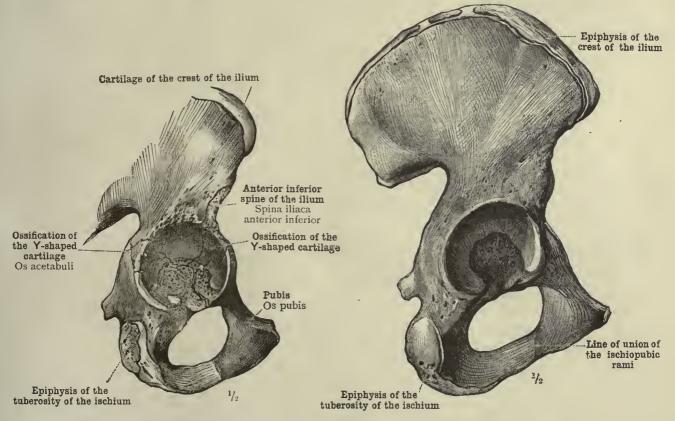


Fig. 317.—In the Fourteenth Year of Life.

Fig. 318.—In the Seventeenth Year of Life.

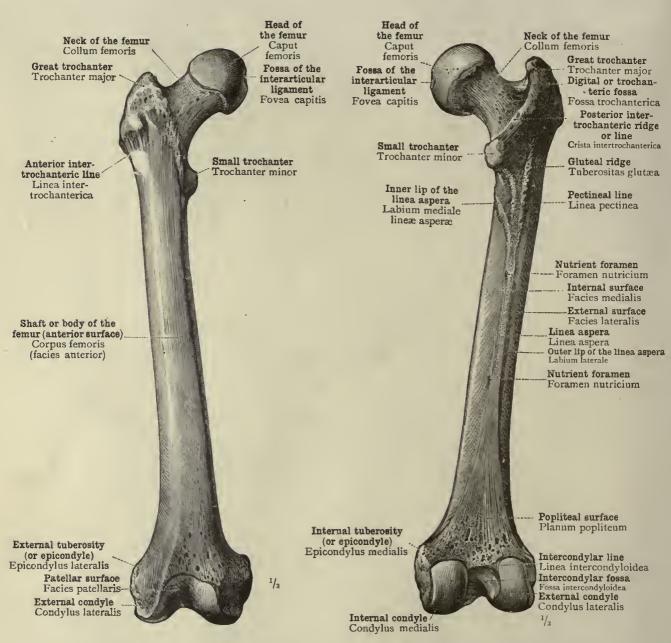
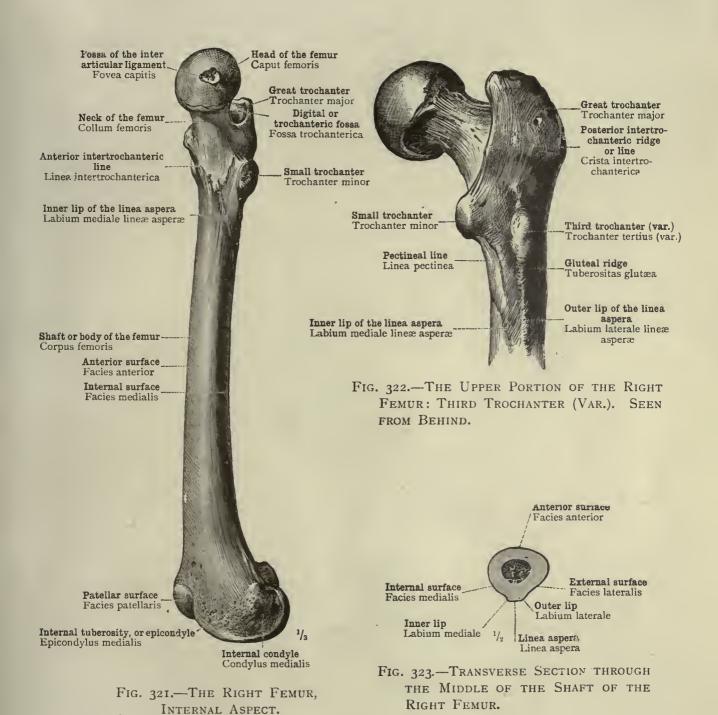


Fig. 319.—The Right Femur, Anterior Aspect.

Fig. 320.—The Right Femur, Posterior Aspect.



Femur-The femui,

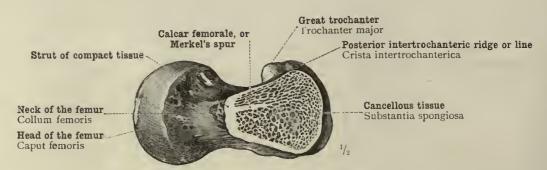


Fig. 324.—Horizontal Section through the Proximal Extremity of the Right Femur, above the Small Trochanter, to show the Calcar Femorale.

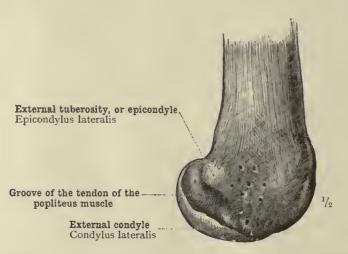


FIG. 325.—DISTAL EXTREMITY OF THE RIGHT FEMUR. SEEN FROM THE OUTER SIDE.

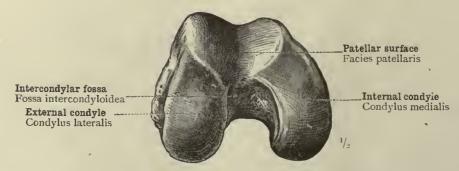


FIG. 326.—DISTAL ARTICULAR EXTREMITY OF THE RIGHT FEMUR. SEEN FROM BELOW.

Femur-The femur.

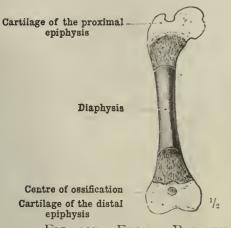


FIG. 327.—FROM A BOY STILL-BORN AT FULL TERM.

Body-length, 21 inches.

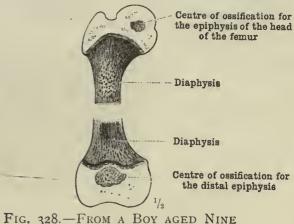


Fig. 328.—From a Boy aged Nine and a Half Months.

Epiphysis of the head of the femur Epiphysis of the Epiphysis of the great Centre of ossificahead of the femur trochanter tion for the great trochanter Diaphysis Epiphysial cartilage of the small trochanter -Calcar femorale Diaphysis\_ Gluteal ridge Epiphysis of the small Tuberositas glutæa trochanter

THE CENTRES OF OSSIFICATION OF THE PROXIMAL AND DISTAL EPIPHYSES.

Fig. 329.—From a Girl aged Seven Years. Fig. 330.—From a Girl aged Fifteen Years.

The Epiphyses of the Proximal Extremity.



FIG. 331.—IN FRONTAL SECTION. FIG. 332.—IN SAGITTAL SECTION.
THE EPIPHYSIS OF THE DISTAL EXTREMITY FROM A GIRL AGED FIFTEEN YEARS.

Development of the Femur.



Fig. 333.—Anterior Aspect.

Fig. 334.—Posterior Aspect.

THE RIGHT TIBIA.



Fig. 335.—Anterior Surface.

Fig. 336.—Posterior Surface.

THE RIGHT PATELLA.

Ossa cruris-The bones of the leg: the patella, rotula, or knee-pan.

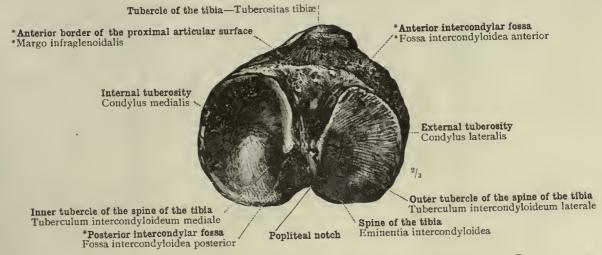


Fig. 338.—Facies Articularis Superior Tibiæ—The Proximal Articular Surface of the Right Tibia.

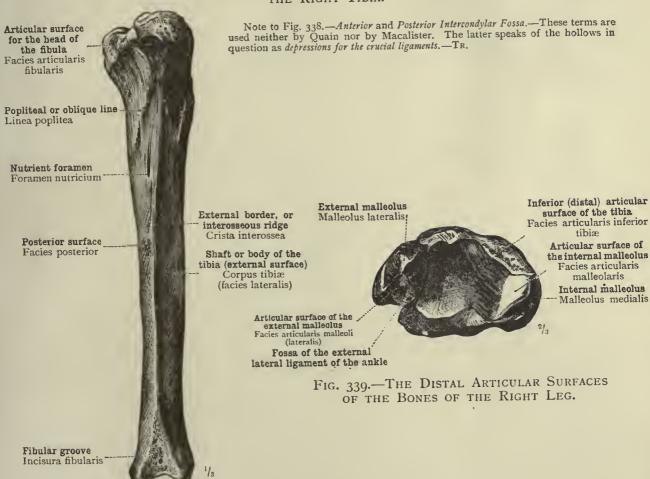


Fig. 337.—RIGHT TIBIA SEEN FROM THE OUTER SIDE.

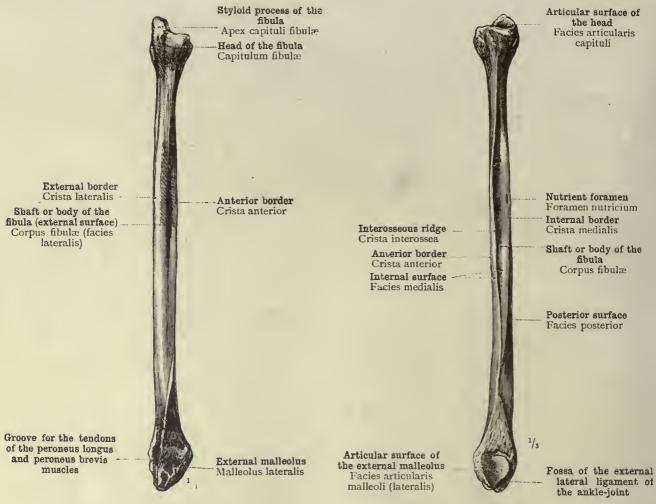


FIG. 340.—EXTERNAL ASPECT.

Fig. 341.—Internal Aspect.

THE RIGHT FIBULA OR PERONEAL BONE.

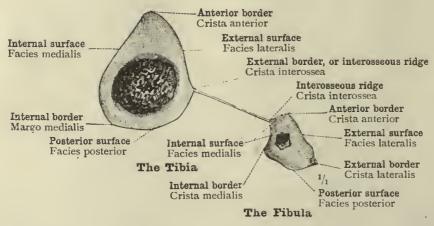


Fig. 342.—Transverse Section through the Middle of the Bones of the Right Leg. With the Interosseous Membrane.

Ussa cruris-Bones of the leg.

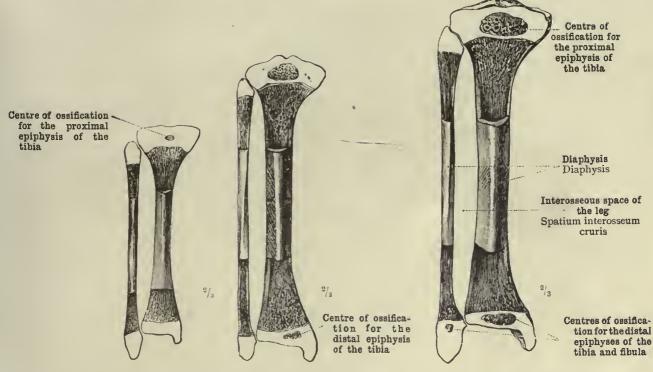


Fig. 343.—From a Boy still- Fig. 344.—From a Boy aged BORN AT FULL TERM. Body length, 21 inches.

NINE AND A HALF MONTHS.

FIG. 345.—FROM A BOY AGED ONE AND A HALF YEARS.

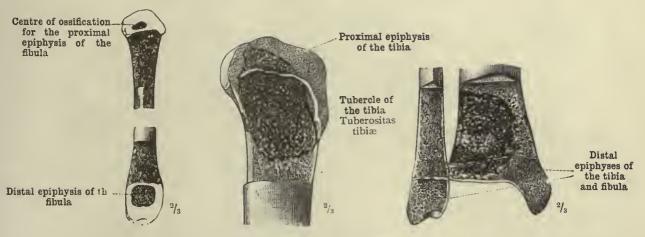


Fig. 346.—Proximal and DISTAL PORTIONS OF THE FIBULA OF A GIRL AGED FOUR AND A HALF YEARS.

OF THE TIBIA OF A GIRL AGED FIFTEEN YEARS. SAGITTAL SECTION.

Fig. 347.—Proximal Portion Fig. 348.—The Distal Portions OF THE BONES OF THE LEG OF A GIRL AGED FIFTEEN YEARS. FRONTAL SECTION.

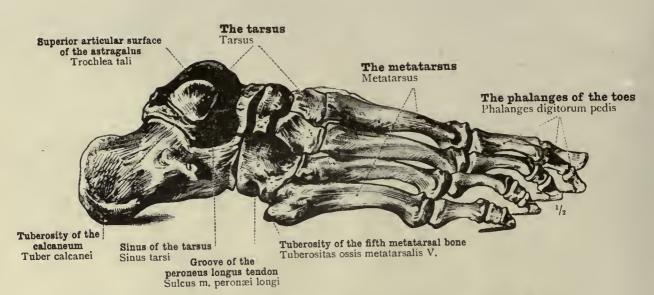


Fig. 349.—Bones of the Right Foot seen from the Outer Side: Facies Dorsalis Pedis et Margo Lateralis Pedis.

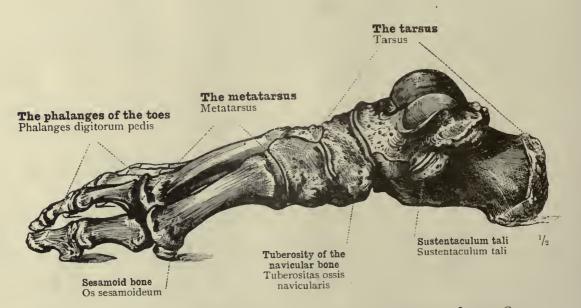


Fig. 350.—The Bones of the Right Foot seen from the Inner Side: Margo Medialis Pedis.

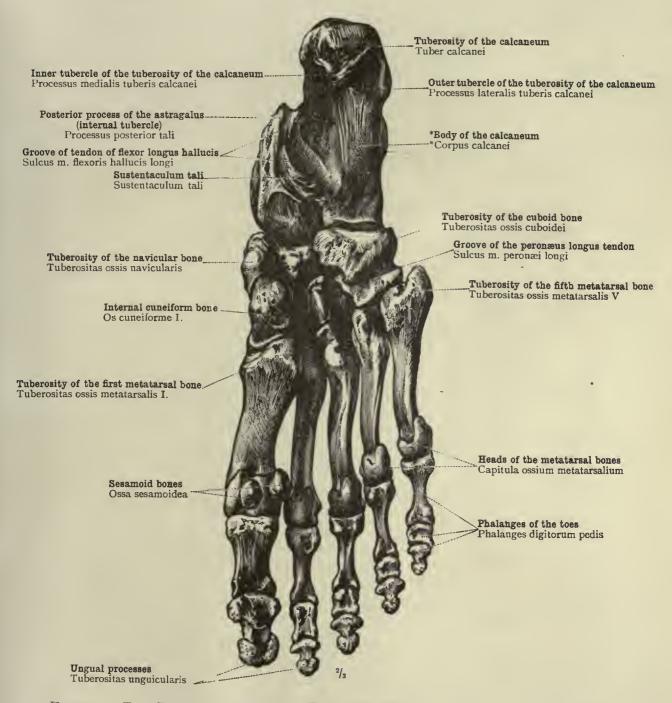


FIG. 351.—THE BONES OF THE RIGHT FOOT SEEN FROM THE PLANTAR SIDE: FACIES PLANTARIS PEDIS.

Skeleton pedis-Bones of the toot.

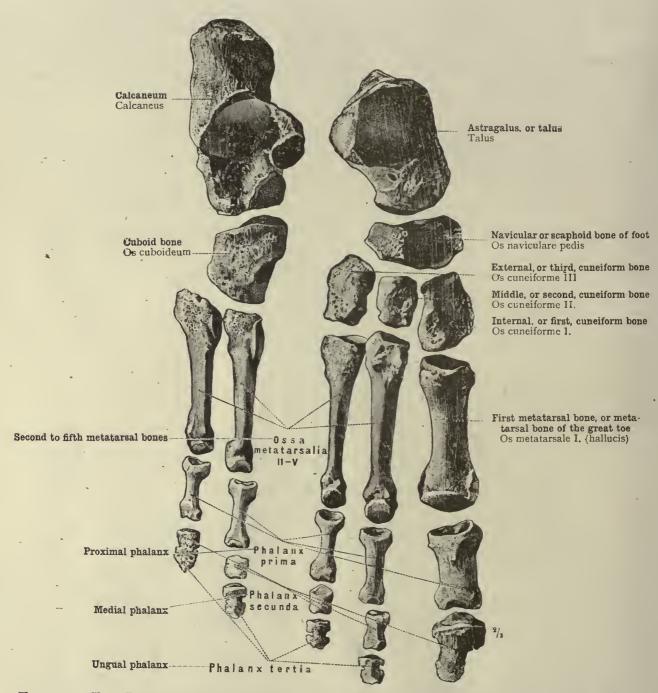


Fig. 352.—The Bones of the Right Foot seen from the Dorsal Side (arranged in Two Longitudinal Rows).

Skeleton pedis-Bones of the foot.

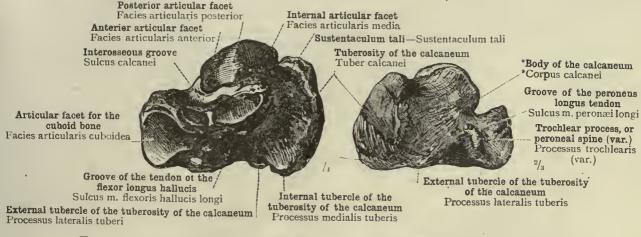


Fig. 353.—Seen obliquely from Within and Before.

Fig. 354.—Seen obliquely from Without and Behind.

THE RIGHT CALCANEUM OR OS CALCIS.

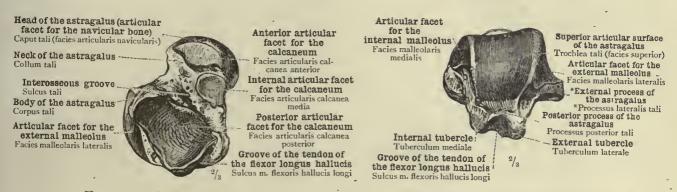


FIG. 355.—SEEN FROM BELOW.

Fig. 356.—Seen from Behind.

THE RIGHT ASTRAGALUS.

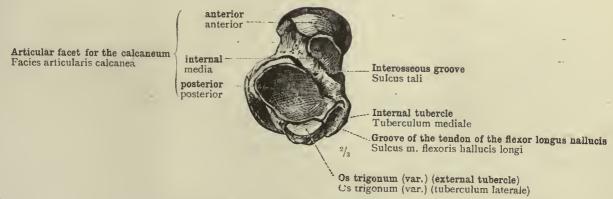


Fig. 357.—The Right Astragalus. With an Os Trigonum (Var.). Seen from Below.

Ossa tarsi-Bones of the tarsus.



Fig. 358.—Anterior Aspect.

Fig. 359.—Posterior Aspect.

OS NAVICULARE PEDIS-THE RIGHT NAVICULAR OR SCAPHOID BONE OF THE FOOT.

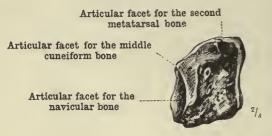


FIG. 360.—EXTERNAL ASPECT.

Upper sharp border Articular facet for the first metatarsal bone Inner surface

Fig. 361.—Anterior Aspect.

OS CUNEIFORME I.—THE RIGHT INTERNAL CUNEIFORM BONE.



INNER ASPECT.

Articular facet for the navicular bone



OUTER ASPECT.

Articular facet for the second metatarsal bone Articular facet for the middle cuneiform bone Articular facet for the navicular bone

INNER ASPECT.

facet for the

surface Articular

Upper

cuboid bone OUTER ASPECT.

Fig. 363.—Os Cuneiforme III.—The Right EXTERNAL CUNEIFORM BONE.

FIG. 362.—OS CUNEIFORME II.—THE RIGHT MIDDLE CUNEIFORM BONE.

Articular facet for the external cuneiform bone Upper surface Articular facet for the fourth metatarsal

bone

Articular facet for the calcaneum

Articular facet for the calcaneum



Groove of the tendon of the peroneus longus Sulcus m. peronæi longi Tuberosity of the cuboid bone Upper surface

Articular facet for the fourth metatarsal bone Articular facet for the fifth metatarsal bone

Groove of the tendon of the

peroneus longus Sulcus m. peronæi longi Fig. 366.—OUTER ASPECT.

FIG. 364.—INNER ASPECT.

Fig. 365.—SEEN OBLIQUELY FROM WITHOUT AND BEHIND.

OS CUBOIDEUM—THE RIGHT CUBOID BONE.

Ossa tarsi-Bones of the tarsus.

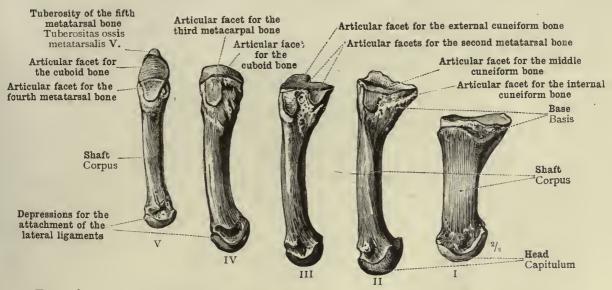


FIG. 367.—THE METATARSAL BONES OF THE RIGHT FOOT SEEN FROM THE INNER SIDE.

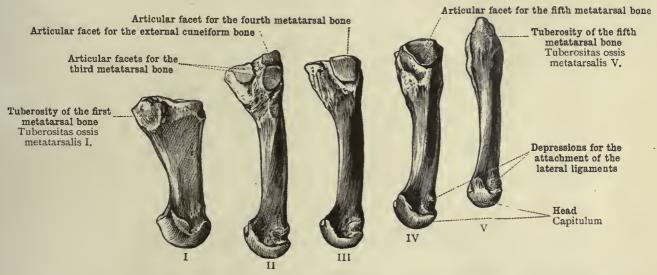


Fig. 368.—The Metatarsal Bones of the Right Foot seen from the Outer Side.

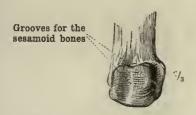


Fig. 369.—Plantar Aspect of the Head of the Metatarsal Bone of the Great Toe (Capitulum Ossis Metatarsalis Hallucis).

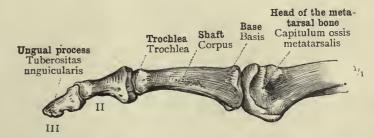


FIG. 370.—THE PHALANGES OF THE SECOND TOE SEEN FROM THE INNER SIDE (MARGO MEDIALIS DIGITI SECUNDI PEDIS).

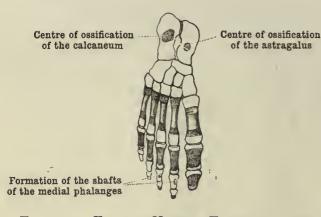


FIG. 371.—FROM A HUMAN FŒTUS IN THE MIDDLE OF THE NINTH MONTH (MONTHS OF FOUR WEEKS EACH).

Body-length, 17½ inches.

FIG. 373.—FROM A BOY AGED

TWELVE WEEKS.

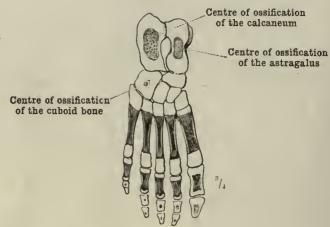


FIG. 372.—FROM A BOY STILL-BORN AT FULL TERM.
Body-length, 22 inches.



Fig. 374.—From a Boy aged Three Years.

Development of the Bones of the Foot.

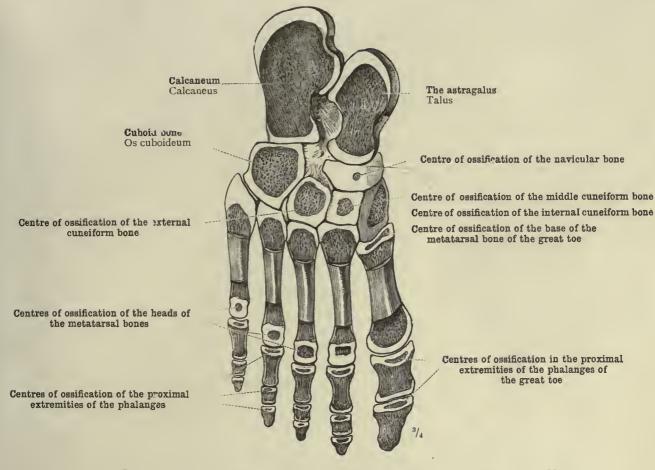


Fig. 375.—Ossification of the Bones of the Foot in a Girl aged Six Years.

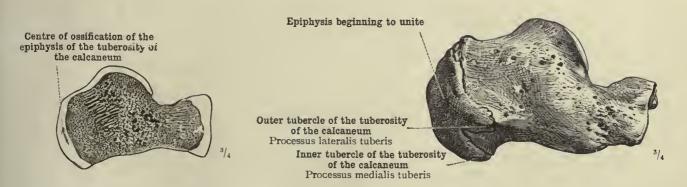


Fig. 376.—From a Girl aged Eight Years.

Fig. 377.—From a Young Man aged Eighteen Years (Epiphysis beginning to unite).

EPIPHYSIS OF THE TUBEROSITY OF THE CALCANEUM.



TO THE

REGIONS OF THE HUMAN BODY

AND TO THE

OSTEOLOGY

## TO THE REGIONS OF THE HUMAN BODY.

| Α.  | ] G.   |
|---|--|
| ABDOMEN, external region of the, 2, 3                   | Gluteal region, 3, 5                                       |
| regions of, 2, 3<br>Abdominal regions, 2, 3             | Ham, the, 3  |
| Acromial region, 3, 4                                   | Hand, dorsal region of the, 2, 3                           |
| Anal region, 5  | palmar region of the, 2, 3                                 |
| Auricular region, 3, 4<br>Axillary region, 2            | Head, regions of the, 4                                    |
| В.  | Hip, region of the, 2, 3                                   |
| Back, medial region of the, 3                           | Hyoid region, 4 Hypochondriac region, 2, 3                 |
| regions of the, 3                                       | Hypogastric region, 2                                      |
| Brachial region, anterior, 2, 3<br>external, 2, 3       |  |
| internal, 2, 3  | Infraclavicular region, 2, 4                               |
| posterior, 3  | Inframammary region, 2                                     |
| Buccal region, 4  | Infra-orbital region, 4                                    |
| C. Calcaneal region, 2, 3                               | Infrascapular region, 3                                    |
| Calf, region of the, 3                                  | Inguinal region, 2 Interscapular region, 3                 |
| Clavicular region, 4                                    | K.   |
| Crural region, anterior, 2                              |  |
| external, 2, 3<br>internal, 2                           | Knee, anterior region of the, 2 posterior region of the, 3 |
| posterior, 3  | posterior region of the, 3                                 |
| D.  | L.   |
| Deltoid region, 2, 3                                    | Labial region, lower, 4<br>upper, 4                        |
| Digital regions of the foot, dorsal, 2                  | Laryngeal region, 4  |
| E.  | Lisfranc, tubercle of, 40                                  |
| Elbow, anterior region of the, 2                        | Lower extremity, regions of the, 2, 3                      |
| external region of the, 2, 3                            | Lumbar region, 3   |
| internal region of the, 2 posterior region of the, 2, 3 | Malleolar region, external, 3                              |
| Epigastric region, 2                                    | internal, 2  |
| F.  | Mammary region, 2  |
| Face, regions of the, 2, 4                              | Mastoid region, 3, 4                                       |
| Femoral region, anterior, 2<br>external, 2, 3           | Mental region, 4 Mesogastric region, 2                     |
| internal, 2, 3  | Mohrenheimer's space, 2, note, 4, note                     |
| posterior, 2  | N.   |
| Fingers, palmar regions of the, 2, 3                    | Nasal region, 2, 4   |
| dorsal regions of the, 3 Foot, dorsal region of the, 2  | Neck, anterior region of the, 2                            |
| plantar region of the, 3                                | external region of the, 2 regions of the, 4                |
| Forearm, dorsal region of the, 2                        | Nuchal region, 3, 4  |
| palmar region of the, 2, 3<br>radial region of the, 2   | O.   |
| ulnar region of the, 2, 3                               | Occipital region, 3, 4                                     |
| Fossa axillaris, 2a                                     | Olecranon, region of the, 2, 3                             |
| carotica, 4a  | Oral region, 2, 4  |
| jugularis, 4 <i>a</i><br>poplitea, 3 <i>a</i>           | Orbital region, 2, 4                                       |
| retromandibularis, 4a                                   | Ρ.   |
| supraclavicularis major, 44                             | Palpebral region, lower, 4                                 |
| Fossa, axillary, 2                                      | upper, 4 Parietal region, 2-4                              |
| infraclavicular, 2, note, 4, note                       | Parotideomasseteric region, 4                              |
| retromandibular, 4                                      | Patellar region, 2   |
| supraclavicular, greater, 4                             | Pectoral regions, 2, 3                                     |
| lesser, 4 Fovea nuchæ, 3a                               | region, external, 2, 3 Perineal region, 3, 5               |
| Frontal region, 2, 4                                    | Pubic region, 2  |
| Furrow, earotid, 4                                      | Pudendal region, 2, 5                                      |
| nuchal, 3   |  |

Regions of the human body, 145 Regio vel regiones: abdominis, 2a, 3a lateralis, 2a, 3a acromialis, 3a, 4a analis, 5a autibrachii dorsalis, 2a radialis, 2a ulnaris, 2a, 3a volaris, 2a, 3a auricularis, 3a, 4a axillaris, 2a brachii anterior, 2a, 3a lateralis, 2a, 3a medialis, 2a, 3a posterior, 3a buccalis, 4a calcanea, 2a, 3a capitis, 4a clavicularis, 4a colli, 4a anterior, 2a lateralis, 2a, 4a corporis humani, 1a-5a coxæ, 2a, 3a cruris anterior, 2a lateralis, 2a, 3a medialis, 2a posterior, 3a cubiti anterior, 2a lateralis, 2a, 3a medialis, 2a posterior, 2a, 3a deltoidea, 2a, 3a digitorum (manus), 2a, 3a pedis, 2a dorsales digitorum (manus), 3a pedis, 2a dorsalis manus, 2a, 3a pedis, 2a dorsi, 3a epigastrica, 2a extremitatis inferioris, 2a, 3a superioris, 2a, 3a faciei, 2a, 4a femoris anterior, 2a lateralis, 2a, 3a medialis, 2a, 3a posterior, 3a frontalis, 2a, 4a genu anterior, 2a posterior, 3a glutæa, 3a, 5a hyoidea, 4a hypochondriaca, 2a, 3a hypogastrica, 2a infraclavicularis, 2a, 4a inframammalis, 2a infra-orbitalis, 4a infrascapularis, 3a inguinalis, 2a interscapularis, 3a labialis inferior, 4a superior, 4a laryngea, 4a lumbalis, 3a malleolaris lateralis, 3a

medialis, 2a

mamunalis, 2a

mentalis, 4a

mastoidea, 3*a*, 4*a* mediana dorsi, 3*a* 

mesogastrica, 2a

Regio vel regiones: nasalis, 2a, 4a nuchæ, 3a, 4a occipitalis, 3a, 4a olecrani, 2a, 3a oralis, 2a, 4a orbitalis, 2a, 4a palpebralis inferior, 4a superior, 4a parietalis, 2a, 3a, 4a parotideomasseterica, 4a patellaris, 2a pectoris, 2a, 3a lateralis, 2a, 3 perinealis, 3a, 5a plantaris pedis, 3a pubica, 2a pudendalis, 2a, 5a retromallcolaris lateralis, 3a medialis, 2a sacralis, 3a, 5a scapularis, 3a sternalis, 2a sternocleidomastoidea, 4a subhyoidea, 4a subinguinalis, 2a submaxillaris, 4a submentalis, 4a supra-orbitalis, 4a suprascapularis, 3a suprasternalis, 4a suralis, 3a temporalis, 2a, 3a, 4a thyreoidea, 4a trochanterica, 2a, 32 umbilicalis, 2a unguiculares, 2a, 3a urogenitalis, 5a volares digitorum, 2a, 3a volaris manus, 2a, 3a zygomatica, 4a Retromalleolar region, external, 3 internal, 2 S. Sacral region, 3, 5 Scapular region, 3 Space, Mohrenheimer's, 2, note, 4, note popliteal, 3
Sternal region, 2
Sternocleidomastoid region, 4 Subhyoid region, 4 Subinguinal region, 2 Submaxillary region, 4 Submental region, 4 Supra-orbital region, 4 Suprascapular region, 3 Suprasternal regiou, 4 T. Temporal region, 2-4 Thyroid region, 4
Triangle, deltoideopectoral, 2, 4
infraclavicular, 2, note, 4, note omoclavicular, 4 Trigonum deltoideopectorale, 2a, 4a omoclaviculare, 4a Trochauteric region, 2, 3 Tubercle of Lisfranc, 40 Umbilical region, 2 Ungual regions, 2, 3 Upper extremity, regions of the, 2, 3 Urogenital region, 5 Z. Zygomatic region, 4

#### TO THE OSTEOLOGY

Certain names in this Index have an asterisk (\*) prefixed; these, as more fully explained in the Translator's Preface, being terms that form part of the English nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger(i) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft."

```
ACETABULUM, 129
Acromion, 108, 110, 111
†Aditus ad antrum tympanicum, 66, 67
           orbitæ, 48, 98
 Agger nasi, 78, 90
Air-cells of the Eustachian tube, 66
 Ala magna, 58-61
ossis ilii, 130
 parva, 58-61
Alæ vomeris, 79, 91, 92
Alisphenoid, 61
 Alveolæ dentales mandibulæ (lower jaw-bone), 84
                           maxillæ (upper jaw-bone), 82
 Ampulla ossea lateralis, 69
                        posterior, 69
                        superior, 69
 Ampulla, osseous, of the external semicircular canal, 69 of the posterior semicircular canal, 69
                              of the superior semicircular canal, 69
 Angle, acromial, 110
            of the jaw, 84, 85
            of Ludwig, 41
            of the parietal bone, frontal, 72, 73
mastoid, 72, 73
occipital, 72, 73
                                            sphenoidal, 72, 73
           of the pubis, 125
of the ribs, 37, 40
of the scapula, inferior, 110
                                   internal, 110
                                    superior, 110
            of the sphenoid bone, parietal, 58-60
            of the sternum, 41
subcostal, 36
Angulus anterior pyramidis, 65
costæ, 37, 40
frontalis (ossis parietalis), 72, 73
              inferior (scapulæ), 110
               infrasternalis, 36
              lateralis (scapulæ), 110
              nateians (scapine), 120
Ludovici, 41
mandibulæ, 84, 85
mastoideus (ossis parietalis), 72, 73
medialis (scapulæ), 110
              occipitalis (ossis parietalis), 72, 73
parietalis (ossis sphenoidalis), 58-60
posterior pyramidis, 65
              pubis, 125
sphenoidalis (ossis parietalis), 72, 73
              sterni, 41
              superior pyramidis, 49, 65
Annulus tympanicus, 70, 103, 104
Antrum of Highmore, 80-82, 93-95, 97, 99
orifice of the, 90
             mastoid, 64, 66, 67, 70
entrance to, 66, 67
tympanicum, 64, 66, 67, 70
Apertura vel aperturæ:
              externa aquæductns vestibuli, 63, 68, 70
                           canaliculi cochleæ, 62, 63
                                            mastoidei, 66
```

```
Apertura vel aperturæ:
              inferior canaliculi tympanici, 62
              interna canaliculi cochleæ, 69
              pelvis [minoris] inferior, 126, 127
                                    superior, 124, 125, 127
              piriformis, 46, 48, 90, 91, 93
sinus maxillaris, 90
sphenoidalis, 58-61, 90-93
†
              sinuum frontalium, 75, 76, 90, 95
superior canaliculi tympauici, 66, 67
              thoracis inferior, 36
 superior, 36
tympanica canaliculi chordæ, 64
Apex capituli fibulæ, 138
         ossis coccygis, 32
 sacri, 30, 31
patellæ, 136
pyramidis, 63, 64, 67, 70
Apophysis articularis (articular apophysis), 43
                costalis (costal apophysis), 43
                muscularis (muscular apophysis), 43
 Aquæductus vestibuli, 69
 Aqueduct of the cochlea, external orifice, 62, 63
internal orifice, 69
               of Fallopius, 64-69
                                deficiency in its tympanic wall, 6
               of the vestibule, 69
                                     external orifice 63, 68, 70
 Arch of the atlas, anterior, 29
                         posterior, 29
         neural, or vertebral, 25, 26
         orbital, 48, 74, 76, 77, 92, 98
         pubic, 124
         of the ribs, 36
zygomatic, 46-48, 96
Arcus anterior atlantis, 29
         costarum, 36
         posterior atlantis, 29
         pubis, 124
superciliaris, 46, 48, 74
         vertebræ, 25, 26
zygoniaticus, 46-48, 96
*Area cochleæ, 68
       cribrosa media, 68
                   superior, 68
       of the facial nerve, 68
        nervi facialis, 68
Arnold's nerve, canal for, 62, 64, 65
Arteria nutricia, 20
protovertebralis, 34
Artery, intercostal, primitive, 34
           nutrient, 20
Articulation, manubrio-gladiolal, 41
Astragalus, 17, 142, 143
Atlas, 29
development of, 35
Atrium meatus medii (atrium of the middle meatus). 90
Auditory aperture, external, 47, 48, 62
internal, 63, 65, 68, 70
```

20

| Axis of the pelvis, 127  | Bone, maxillary, superior, 46, 47, 53, 80, 81                  |
|--|--|
| Axis, the, 29<br>development of, 35                                      | development of, 82<br>metacarpal, first, 106, 119              |
| development of, 33   | nasal, 53, 79, 90, 91  |
| D  | navicular, 142, 144  |
| В.   | occipital, 52, 54-56   |
| Base of the mandible, 85, 87   | development of, 57, and note                                   |
| of the patella, 136<br>of the sacrum, 32                                 | palate, 53, 83<br>parietal, 19, 52, 72, 73                     |
| of the skull, external aspect, 48  | development of, 21   |
| internal aspect, 49  | pisiform, 118-120  |
| Bases of the metacarpal bones, 122                                       | premaxillary, 82, 97   |
| of the metatarsal bones, 145   | pyramidal, 119, 120  |
| of the phalanges of the fingers, 122<br>of the toes, 145                 | scaphoid, 119, 120<br>sphenoid, 52, 58-60                      |
| Basilar portion of the occipital bone, 54-57, 60                         | development of, 61   |
| Basi-occipital portion of the occipital bone, 54-57, 60, and             | sphenoidal spongy, 58, 59, 61                                  |
| note, p. 57  | turbinate, 58, 59, 61  |
| Basis cranii externa, 48   | subcoracoid, 111<br>temporal, 52, 62-69                        |
| interna, 49<br>mandibulæ, 85, 87   | development of, 70, 71   |
| ossis sacri, 32  | trapezoid, 119-121   |
| ossium metacarpalium, 122  | turbinate of the nose, highest, 78                             |
| metatarsalium, 145   | inferior, 53, 70, 90, 91, 93-95                                |
| patellæ, 136<br>phalangis manus, 122                                     | middle, 78, 90, 94, 95<br>superior, 78, 90, 92, 94             |
| pedis, 143   | unciform, 119-121  |
| Basisphenoid, 58-61  | Bones, general considerations, 9-21                            |
| Bertin, bones of, 58, 59, 61   | development of, 20, 21   |
| Bodies of the metacarpal bones, 122                                      | flat, 19   |
| of the metatarsal bones, 145<br>of the phalanges of the fingers, 122     | long, 12-15<br>minute structure, 10                            |
| of the toes, 145   | short, 16, 17, 21  |
| of the ribs, 40  | of Bertin, 58, 59, 61  |
| of the vertebræ, 25-27   | of the carpus, 120, 121  |
| Body of the astragalus, 143<br>of the calcaneum, 141, 143                | development of, 123<br>of the cranium proper, 52               |
| of the fenur, 132, 133   | of the face, 53  |
| of the fibula, 138   | of the forearm, 106, 114-116                                   |
| of the humerus, 112  | development of, 117  |
| of the hyoid bone, 87  | of the leg, 107, 136-138                                       |
| of the ilium, 130<br>of the inferior maxillary bone, 84-87               | development of, 139  |
| of the ischium, 128, 130   | development of, 123  |
| of the malar bone, 83  | metatarsal, 142, 145   |
| of the mandible, 84-87   | development of, 146, 147                                       |
| of the maxilla, 80, 81, 87, 89   | sesamoid, of foot, 140, 141<br>of hand, 118                    |
| of the os calcis, 141, 143<br>of the pubis, 130                          | of the skull, 52-104   |
| of the radius, 115   | suprasternal, 41   |
| of the sphenoid bone, 58-61  | of the tarsus, 17, 143, 144                                    |
| of the sternum, 41   | development of, 146, 147                                       |
| of the superior maxillary bone, 80, 81, 87, 89<br>of the tibia, 136, 137 | Wormian, 100<br>Border of the fibula, anterior, 138            |
| of the ulna, 114   | external, 138  |
| Bone, capitate, 119-121  | internal, 138  |
| central, of the carpus, 120  | of the frontal bone, masal, 76, 77                             |
| cuboid, 142, 144<br>cuneiform, of foot, external, 17, 142, 144           | parietal, 74-76  |
| first, 141, 142, 144   | sphenoidal, 75, 76   |
| internal, 141, 142, 144  | of the humerus, inner, 112                                     |
| middle, 142, 144   | outer, 112   |
| second, 142, 144   | of the occipital bone, lambdoid, 54-26<br>mastoid, 54-56       |
| third, 17, 142, 144<br>of hand, <b>1</b> 19, 120                         | of the parietal bone, anterior, 72, 73                         |
| ethmoid, 52, 73  | frontal, 72, 73  |
| frontal, 52, 74-76   | inferior, 72, 73   |
| development of, 77   | occipital, 72, 73  |
| hip-, 107, 128-130<br>development of, 131                                | posterior, 72, 73<br>sagittal, 72, 73                          |
| hyoid, 87  | squamous, 72, 73   |
| innominate, 107, 128-130   | superior, 72, 73   |
| development of, 131  | of the petrous portion of temporal bone, anterior, 6           |
| interparietal, 100, note to p. 57  | of the petrous portion of the temporal bone, po-<br>terior, 65 |
| lachrymal, 53, 79, 90-92, 95<br>lunar, 119, 120                          | of the petrous portion of the temporal bone, superio           |
| malar, 53, 83  | 49, 65   |
| -marrow, 11  | of the radius, anterior, 114, 115                              |
| maxillary, inferior, 46, 47, 53, 84-86                                   | internal, 114, 115   |
| development of, 86   | posterior, 114, 115  |

| Border of the scapula, axillary, 110                               | Canaliculus vel canaliculi (see also "Canal"):                              |
|--|---|
| superior, 110  | caroticotympanici, 62, 67   |
| vertebral, 110<br>of the sphenoid, external, 58-60                 | chordæ tympani, 64, 65, 67<br>cochleæ (apertura externa), 62, 63            |
| frontal, 58, 59  | (apertura interna), 69  |
| malar, 58-60   | † innominatus, 93   |
| orbital, 59  | mastoideus, 62, 64, 65<br>† sphenoidalis, 92, 93, 96, 99                    |
| . petrous, 59<br>posterior, 59                                     | tympanicus, 65  |
| squamous, 58-60  | Canalis vel canales:  |
| of the superior maxillary bone, infra-orbital, 80, 83,             | alveolares, 81  |
| 98<br>lachrymal, 80  | basipharyngeus, 48, 58, 59, 90<br>caroticus, 62-65, 67, 70, 71, 96          |
| of the temporal bone, occipital, 62, 63                            | condyloideus, 54-57, 88, 89   |
| parietal, 62, 63   | diploici [Brescheti], 19, 51, 88  |
| sphenoidal, 62-64  | facialis [Fallopii], 64, 65, 67-69<br>hypoglossi, 54-57, 88                 |
| of the tibia, anterior, 136, 138<br>external, 136-138              | incisivus, 80, 91   |
| internal, 136, 138 ·   | infra-orbitalis, 80, 81, 95   |
| of the ulna, anterior, 114   | mandibulæ, 86   |
| external, 114<br>posterior, 114                                    | musculotubarius, 63, 64<br>nasolacrimalis, 93, 95                           |
| Breschet's canals, 19, 51, 88                                      | nutricius, 13, 18, 19   |
| Brim of the pelvis, 124, 125                                       | palatini, 90, 97  |
| iliac portion, 125   | pharyngeus, 48, 58, 59, 90-92   |
| pubic portion, 125<br>sacral portion, 30, 125                      | pterygoideus [Vidii], 58, 59, 61, 92, 93, 96, 9<br>pterygopalatinus, 97, 99 |
| Bulla, ethmoidal, 78, 90   | sacralis, 31, 32  |
| C.   | semicircularis lateralis, 67-69   |
|  | posterior, 68, 69   |
| Calcaneum, or os calcis (called by Toldt "Calcaneus"), 17,         | superior, 68, 69<br>vertebralis, 43   |
| development of, 146, 147   | Capitellum of the humerus, 112  |
| Calcar femorale, 134, 135  | Capitulum costæ, 40   |
| Calvaria, 50 Canal or canals (see also "Canaliculus"):             | fibulæ, 138<br>humeri, 112  |
| for Arnold's nerve, 62, 64, 65                                     | mandibulæ, 84-86, 96  |
| external orifice of, 66  | ossium metacarpalium, 122   |
| for the auricular branch of the pneumogastric                      | metatarsalium, 141, 145   |
| nerve, 62, 64, 65<br>basipharyngeal (see note to p. 48), 48, 58-60 | radii, 115<br>ulnæ, 114   |
| of Breschet, 19, 51, 88  | Caput femoris, 132-134  |
| carotid, 62-65, 67, 70, 71, 76                                     | humeri, 112   |
| for the chorda tympani nerve, 64, 65, 67<br>dental, 81             | † ossis capitati, 121<br>tali, 143  |
| anterior and middle, 81  | Carpus, 106, 118  |
| inferior, 86   | Cartilage, Meckel's, 103  |
| posterior, 80, 81, 99  | Cartilages, costal, 39, 40<br>Cartilago costalis, 39, 40                    |
| diploic, 19, 51, 88<br>ethmoidal, anterior, 76, 90, 91, 98         | Cavitas glenoidalis, 110, 111   |
| posterior, 76, 91, 98  | Cavity, cranial, 88, 89   |
| of the Eustachian tube, 63, 64, 66, 67, 69                         | medullary, 11, 18-20  |
| of the facial nerve, 64, 69<br>Haversian, 10                       | nasal, 90-95<br>sigmoid (of the radius), 115                                |
| iufra-orbital, 80, 81, 95  | (of the ulua), great, 114, 115  |
| internal orbital, auterior, 76, 90, 91, 98                         | small, 114  |
| posterior, 76, 91, 98<br>for Jacobson's nerve, 65-67               | thoracic, 43<br>tympanic, 67  |
| inferior orifice, 62   | †Cavum cranii cerebralis, 88, 89  |
| superior orifice, 66, 67   | niedullare, 11, 18-20   |
| - malar, 83  | nasi, 90-95   |
| mandibular, 86<br>medullary, 11, 18-20                             | thoracis, 43<br>tympani, 65-70, 96  |
| nutrient, 13, 18, 19   | Cells, ethmoidal, 76, 78, 90  |
| palatine, accessory, 83, 90, 91, 97                                | of the Eustachian tube, 66  |
| posterior, 97, 99<br>inferior orifice of, 90, 96, 97               | niastoid, 64, 67<br>tympanic, 67  |
| palato-maxillary, 97, 99   | Cellulæ ethmoidales, 78, 90   |
| inferior orifice of, 90, 96, 97                                    | mastoideæ, 64, 67   |
| pterygoid (or Vidian), 58, 59, 61, 92, 93, 96, 99                  | pneumaticæ tubariæ, 66  |
| pterygopalatine, 48, 58-60, 90-92                                  | tympanicæ, 67<br>Centra of the vertebræ, 25-27                              |
| sacral, 31, 32<br>semicircular, external, 67-69                    | Choauæ, 48, 93, 96  |
| posterior, 68, 69  | Chorda dorsalis, 34   |
| superior, 68, 69   | tympani nerve, canal for, 64, 65, 67  |
| spinal, 43<br>temporal, 83   | orifice of the canal for, 64 Cingulum extremitatis inferioris, 107, 124-126 |
| of the tensor tympani muscle, 63, 64, 66, 67, 69                   | superioris, 106, 108  |
| Vidian (or pterygoid), 58, 59, 61, 92, 93, 96, 99                  | Circumference, articular, of the radius, 115                                |
| Volkmann's, 10, 11   | of the ulna, 114  |

155

| Circumferentia articularis radii, 115  | Cranium, primordial (cranium primordiale), 102, 103                            |
|--|--|
| ulnæ, 114<br>Clavicula (the clavicle), 106, 108, 109                           | proper (cranium cerebrale), 52, 88, 89 *Crest, buccinator, 84, 85              |
| Clivus, 49, 56, 88   | ethmoidal, of the palate-bone, 83  |
| Coccyx, the, 24, 32, 33, 125, 126  | of the superior maxillary bone, 80, 81   |
| development of, 35<br>extremity of the, 32                                     | frontal, 49, 50, 75, 88  of the fundus of the internal auditory meatus, trans  |
| Cochlea, 65, 68, 69  | verse, 65, 68  |
| Collum anatomicum, 112<br>chirurgicum, 112                                     | of the ilium, 128-130  |
| costæ, 40  | inferior turbinate, of the superior maxillary bone<br>80, 81                   |
| femoris, 132-134   | infratemporal, 48, 58-60, and note, p. 59                                      |
| mandibulæ, 84, 85<br>radii, 115  | lachrymal, 79, 98  |
| scapulæ, 110   | * anterior, see "Ridge, orbital"  * posterior, see "Crest, lachrymal"          |
| tali, 143  | nasal, of the superior maxillary bone, 91, 95, 97                              |
| Column, spinal, 24<br>development of, 34, 35                                   | obturator, 130<br>occipital, external, 48, 55, 56                              |
| vertebral, 24  | internal, 49, 54, 56   |
| development of, 34, 35   | of the occipital bone for the rectus capitis posticu                           |
| Concavity of the carpus, 118<br>Concha nasalis inferior, 53, 79, 90, 91, 93-95 | major muscle, 56 of the occipital bone for the rectus capitis posticu          |
| media, 78, 90, 94, 95  | ninor muscle, 56   |
| superior, 78, 90, 92, 94<br>suprema [Santorini], 78                            | * orbital, 59  |
| Conchæ sphenoidales, 58, 59, 61  | of the septum of the nose, lateral, 93 * sacral, articular, 31                 |
| Condylar portion of the occipital bone, 54, 56, 57, and note,                  | * external, 31   |
| p. 57<br>Condyle of the femur, external, 132, 134                              | * median, 31<br>sphenoidal, 58, 59   |
| internal, 132-134  | supramastoid, 62   |
| of the humerus, external, 112  | temporal, 46, 74, 77   |
| of the inferior maxillary bone, 84-86, 96                                      | transverse, see "Crista falciformis"   |
| of the mandible, 84-86, 96   | turbinate, inferior, of the palate-bone, \$3<br>of the superior maxillary bone |
| Condyles of the occipital bone, 48, 54-56                                      | 80, 81   |
| Condylus lateralis femoris, 132, 134<br>tibiæ, 136, 137                        | superior, of the palate-bone, 83<br>of the vestibule, 69                       |
| medialis femoris, 132-134  | Crista anterior (fibulæ), 138  |
| tibiæ, 136, 137  | (tibiæ), 136, 138  |
| occipitalis, 48, 54-56<br>Conjugata diagonalis, 127                            | buccinatoria, 84, 85<br>capituli costæ, 40                                     |
| vera, 127  | colli costæ, 40  |
| Conjugate diameter, diagonal, 127  | conchalis (maxillæ), 80, 81  |
| true, 127<br>Cornu, coccygeal, 32  | (ossis palatini), 83<br>ethmoidalis (maxillæ), 80, 81                          |
| of the hyoid bone, great, 87   | (ossis palatini), 83   |
| small, 87  | falciformis, 65, 68  |
| sacral, 31, 32<br>Cornua sphenoidalia, 58, 59, 61                              | frontalis, 49, 50, 75, 88<br>galli, 49, 78, 88, 94, 95                         |
| Corpus calcanei, 141, 143  | iliaca, 128-130  |
| costæ, 40  | infratemporalis, 48, 58-60   |
| femoris, 132, 133<br>fibulæ, 138   | interossea (fibulæ), 138<br>(radii), 114, 115                                  |
| humeri, 112  | (tibiæ), 136-138   |
| nıandibulæ, 84-87<br>maxillæ, 80, 81, 87, 99                                   | (uluæ), 114<br>intertrochanterica, 132-134                                     |
| ossis liyoidei, 87   | lacrimalis anterior, 80, 98  |
| ilium, 130   | posterior, 79, 98  |
| ischii, 128, 130<br>pubis, 130   | lateralis (fibulæ), 138<br>septi (nasi), 93                                    |
| sphenoidalis, 58-61  | medialis (fibulæ), 138   |
| ossium metacarpalium, 122  | musculi recti capitis majoris, 56  |
| metatarsalium, 145<br>phalangis manus, 122                                     | nnuoris, 56<br>supinatoris, 114  |
| pedis, 145   | nasalis, 91, 95, 97  |
| radii, 115   | Obturatoria, 130   |
| sterni, 41<br>tali, 143  | occipitalis externa, 48, 55, 56<br>interna, 49, 54, 56                         |
| tibiæ, 136, 137  | orbitalis (alæ magnæ), 59  |
| ulnæ, 114  | sacralis articularis, 31   |
| vertebræ, 25-27<br>Costæ, 38 40  | lateralis, 31<br>medialis, 31  |
| development of, 42   | sphenoidalis, 58, 59   |
| spuriæ, 36   | transversa, 65, 68   |
| veræ, 36<br>Cranionietry, 101  | tuberculi majoris, 112<br>minoris, 112   |
| Cranium, 45-104  | vestibuli, 69  |
| cavity of, 88, 89  | Crus commune and crus simplex of the semicircular canals                       |
| facial portion (cranium viscerale), 53, 96, 97                                 | 69, and note, p. 69 Cupular portion of the epitympanic recess, 64              |
| 1,00,7,71  | 1  |

20-2

| D.   | Facet or facets, articular: of the vertebræ, inferior, 25-27       |
|--|--|
| Dens epistrophei, 29   | superior, 25-27  |
| Depression, digital, 85<br>Depressions for the lateral metatarso-phalangeal ligaments, | Facial portion of the skull, 53                                    |
| Depressions for the lateral metatariss parameters 145                                  | †Facies, anterior femoris, 132, 133<br>lateralis humeri, 112       |
| Pacchionian, 50, 73  | maxillæ, 80  |
| Diameter, conjugate, of the pelvis, diagonal, 127                                      | medialis humeri, 112   |
| Diameters, oblique, of the pelvis, 127   | pyramidis, 65  |
| transverse, of the pelvis, 127   | articularis acromialis (claviculæ), 109<br>acromii, 110            |
| Diaphysis, 20  | anterior calcanei, 143   |
| Digiti (manus), 118  | epistrophei, 29  |
| pedis, 140, 141  | calcanea (tali) anterior, 143                                      |
| Diploë, 19, 50, 51<br>of the frontal bone, 76, 77                                      | media, 143<br>posterior, 143                                       |
| Disc, epiphysial, 20   | capituli costæ, 40   |
| Dorsum of the foot, 140  | fibulæ, 138  |
| - of the scapula, 110<br>sellæ, 58-61, 96  | carpea, 115<br>enboidea (calcanei), 143                            |
|  | fibularis, 136, 137  |
| Ε.   | inferior tibiæ, 137  |
| Eminence, articular, 62  | vertebrarum, 25-27   |
| deltoid, 112<br>frontal, 46, 74, 77, 104   | malleolaris (tibiæ), 137<br>malleoli (lateralis), 137, 138         |
| iliopectineal, 128, 130  | media (calcanei), 143  |
| jugular, 54, 56  | navicularis (tali), 143  |
| olivary, 59-61   | ossis temporalis, 62, 70, 71                                       |
| parietal, 72, 104<br>papillary, 66, 67, 69   | patellæ, 136<br>posterior (calcanei), 143                          |
| of the second rib for the serratus magnus, 40  | sternalis (claviculæ), 109   |
| of the superior semicircular canal, 63, 70   | superior tibiæ, 137  |
| Eminentia arcuata, 63, 70<br>carpi radialis, 118                                       | vertebrarum, 25-27<br>tuberculi costæ, 40                          |
| ulnaris, 118   | auricularis ossis ilium, 128                                       |
| cruciata, 54, 89   | sacri, 31, 32  |
| iliopectinea, 128, 130<br>intercondyloidea, 136, 137                                   | cerebralis alæ magnæ, 58, 61<br>ossis frontalis, 75                |
| papillaris, 66, 67, 69   | parietalis, 73   |
| nyramidalis, 66, 67, 69  | squamæ temporalis, 63, 64  |
| Entrance to the mastoid antrum, 66, 67<br>to the orbit, 48, 98                         | costalis scapulæ, 110  |
| Epicondyle of the femur, external, 132, 134  | † dorsalis manus, 119<br>ossis sacri, 31, 32, 126                  |
| internal, 132, 133   | † pedis, 140   |
| Epicondylus lateralis (femoris), 132, 134<br>(humeri), 112                             | radii, 114-116   |
| medialis (femoris), 132, 135   | scapulæ, 110<br>ulnæ, 114  |
| (humeri), 112  | frontalis (ossis frontalis), 74                                    |
| Epiphysis, 20  | inferior pyramidis, 65   |
| Epistrophens, 29<br>development of, 35   | infratemporalis (maxillæ), 80, 99<br>† lateralis femoris, 132, 133 |
| Enitympanic recess, 63, 69, 70   | fibulæ, 138  |
| Eustachian canal, 63, 64, 66, 67, 69<br>Extremitas acromialis (claviculæ), 109         | radii, 114-116   |
| sternalis (claviculæ), 109   | lunata (acetabuli), 130  |
| Extremity of the clavicle, acromial, 109   | malaris (ossis zygomatici), 83                                     |
| sternal, 109<br>Exoccipital, 54, 56, 57, and note, p. 57                               | malleolaris lateralis (tali), 143<br>medialis (tali), 143          |
| Exoccipital, 54, 50, 57, and note, p. 57   | maxillaris ossis palatini, 83                                      |
| F.   | † medialis femoris, 132, 133                                       |
| Paget or facets articular:   | fibulæ, 138  |
| of the acromion, clavicular, 110   | tibiæ, 136, 138<br>ulnæ, 114                                       |
| of the atlas, superior, 29   | nasalis maxillæ, 80  |
| of the astragalus—<br>for the calcaneum, auterior, 143                                 | ossis palatini, 83   |
| middle, 143  | orbitalis alæ magnæ, 58-61, 98<br>maxillæ, 80                      |
| posterior, 143   | ossis frontalis, 76  |
| for the external malleolus, 143<br>for the internal malleolus, 143                     | zygomatici, 83   |
| for the navicular bone, 143  | ossea, 53<br>parietalis (ossis parietalis), 72                     |
| of the clavicle, acromial, 109   | patellaris, 132-134  |
| sternal, 109<br>of the heads of the ribs, 40   | pelvina (ossis sacri), 30, 32, 125                                 |
| of the odontoid process, anterior, 29  | † plantaris pedis, 141<br>posterior fibulæ, 138                    |
| of the os calcis, anterior, 143  | humeri, 112  |
| cubo1d, 143  | pyramidis, 65  |
| internal, 143<br>posterior, 143  | tibiæ, 136-138   |
| for the ribs (sternal), 41   | sphenomaxillaris (alæ magnæ), 58, 99<br>superior (tali), 143       |
| of the tubercles of the ribs, 40   | Superior (tati), -43   |

| Facies symphyseos, 128  | Foramen or foramina:  |
|---|---|
| temporalis alæ magnæ, 58-61                                       | nutricium humeri, 112   |
| ossis frontalis, 74, 77   | ossis ilii, 19  |
| zygomatici, 83<br>squamæ temporalis, 62, 63                       | radii, 115, 116<br>tibiæ, 18, 136, 137                                |
| volaris manus, 118  | ulnæ, 114, 116  |
| radii, 114-116  | nutrient, 18, 19  |
| ulnæ, 114, 116  | of the clavicle, 109  |
| Femur, the, 14, 107, 132-134                                      | of the femur, 132   |
| development of, 135<br>Fenestra cochleæ, 67, 69                   | of the fibula, 138<br>of the humerus, 112                             |
| ovalis, 67-69   | of the ilium, 19  |
| rotunda, 67, 69   | of the radius, 115, 116   |
| vestibuli, 67-69<br>Fibres, Sharpey's, 10                         | of the tibia, 18, 136, 137  |
| Fibula, the, 107, 138   | of the ulna, 114, 116<br>obturator, 128-130                           |
| development of, 139   | optic, 59-61, 88, 98, 99  |
| Fingers, skeleton of, 118   | ovale (of the hip-hone), 128-130                                      |
| Fissura orbitalis inferior, 93, 96, 98                            | (of the skull), 59, 61, 96  |
| superior, 58, 59, 88, 92, 98<br>petro-occipitalis, 48, 49, 88     | palatina minora, 83, 90, 97<br>palatinum majus, 90, 96, 97            |
| petrosquamosa, 63, 64, 69   | * palatine, great, 90, 96, 97   |
| petrotympanica [Glaseri], 62, 65, 70, 71                          | parietal, 72, 73, 100   |
| pterygoidea, 58, 59 .   | pterygospinous, 91  |
| pterygomaxillarıs, 99<br>spheno-occipitalis, 60                   | rotundum, 58-61, 88, 92, 93, 99<br>sacral, anterior, 30               |
| sphenopetrosa, 48, 49   | posterior, 31   |
| tympanomastoidea, 62, 66, 71                                      | singulare, 68   |
| Fissure, Glaserian, 62, 65, 70, 71                                | sphenoidal, 58-61, 90-93  |
| incisor, 48, 82, 97<br>occipitosphenoidal, 60                     | splienopalatine, 90, 91, 98, 99<br>spinal, 25-27                      |
| orbital, 58, 59, 88, 92, 98                                       | spinosum, 59  |
| petrobasilar, 48, 49, 98  | of Stenson, 82  |
| petrosquamous, 63, 64, 69   | * stylomastoid, 62; 64, 67, 70, 71                                    |
| pterygoniaxillary, 99<br>sphenoniaxillary, 93, 96, 98             | supra-orbital, 74, 76<br>thyroid, 128-130                             |
| tympanomastoid, 62, 66, 71  | transversarium, 26, 29  |
| Fontanelle, anterior, 104   | vertebrale, 25-27   |
| anterolateral, 104<br>posterior, 104                              | for vertebral artery, 26, 29  |
| posterolateral, 104   | of Vesalius, note to p. 92 (see also "Canaliculus, sphenoidal")       |
| Fonticulus frontalis [major], 104                                 | zygomaticofaciale, 83   |
| mastoideus, 104   | zygomatico-orbitale, 83   |
| occipitalis [minor], 104<br>sphenoidalis, 104                     | zygomaticotemporale, 130 Fossa acetabuli, 130                         |
| Foramen or foramina:  | canine, 80  |
| alveolar, anterior and middle, &                                  | condylar, posterior, 55   |
| posterior, 80, 81, 99<br>cæcum, 49, 75, 88, 91, 94                | coronoid, 112<br>cranial, anterior, 49, 88, 95                        |
| condylar, anterior, 54-57, 88                                     | middle, 49, 88  |
| posterior, 54-57, 88, 89  | posterior, 49, 88   |
| costotransverse, 26, 29   | digastric (of the inferior maxillary bone), 85                        |
| † emissarii occipitalis, 89<br>emissary, mastoid, 62, 63, 89      | (of the temporal bone), 62, 71 digital, 132, 133                      |
| occipital, 89   | of the external lateral ligament of the ankle-joint,                  |
| of Vesalius, see "Canaliculus splie-                              | 137, 138  |
| noidalis," and note, p. 92<br>ethmoidale anterius, 76, 90, 91, 98 | floccular, 63, 70   |
| posterius, 76, 91, 98   | glandulæ lachrymalis, 76, 77, 92, 98<br>of the Gasserian ganglion, 63 |
| frontale, 76  | glenoid, of the scapula, 110, 111                                     |
| iucisivum, 82, 93, 96, 97   | of the temporal bone, 62, 70, 71                                      |
| inferior dental, 85<br>infra-orbital, 80, 81, 98, 99              | liypophyseos, 59-61, and note to p. 60 iliac, 128                     |
| intervertebral, 24  | * of the incus, 64  |
| of the sacrum, 31   | infraspinous, 110   |
| jugular, 48, 49, 88   | infratemporal, 48, 96   |
| bipartite, 88<br>divided by an intrajugular process, 88           | intercondylar, of the femur, 132, 134<br>of the tibia, anterior, 137  |
| lacerate, anterior, 58, 59, 88, 92, 98                            | intercondyloidea (femoris), 132, 134                                  |
| middle, 48, 49  | anterior (tibiæ), 137   |
| posterior, 48, 49, 88   | posterior (tibiæ), 137  |
| mandibular, 85<br>magnum, 48, 54-56, 89                           | jugular, of the temporal bone, 62, 65<br>lachrymal, 76, 77, 92, 98    |
| mastoid, 62, 63, 89   | * mandibularis, 62  |
| mental, 85, 86  | occipital, inferior, 54, 56   |
| nasal, 79   | superior, 54  |
| nutricium, 18, 19<br>claviculæ, 109                               | olecranon, 112<br>palatine, anterior, 82, 96, 97                      |
| femoris, 132  | pituitary, 59-51  |
| fibulæ, 138   | prenasal. 97  |

| Fossa, pterygoid, 58, 95  | Groove or grooves:   |
|---|--|
| pterygopalatina, 92, 98, 99                                     | palatomaxillary, 80  |
| radial, 112   | of the palate-bone, 83   |
| reniform, 65  | of the sphenoid bone, 58, an note to same  |
| sacci lacrimalis, 98<br>scaphoid, 58                            | preauricular, 128  |
| sphenomaxillary, 92, 98, 99                                     | of the promontory, for the nerves of the tympani                                 |
| subarcuata, 63, 70  | plexus, 67   |
| subscapular, 110  | * pterygopalatine, note to p. 58 spiral, 112                                     |
| supraspinous, 110<br>temporal, 47                               | for spinal nerve, 26   |
| trochanterica, 132, 133   | of the subclavian artery, 40   |
| trochlear, 76   | subcostal, 40  |
| vermian, 89   | of the superficial petrosal nerve, great, 63, 64 small, 63, 64                   |
| zygomatic, 48, 96<br>Fossula fenestræ cochleæ, 66, 68           | of the tendon of—  |
| vestibuli, 66   | the flexor carpi radialis muscle, 121  |
| -of the fenestra ovalis, 66                                     | the flexor longus hallucis muscle, 141, 14                                       |
| rotunda, 66, 68<br>ovalis, 66                                   | the peroneus longus muscle, 140, 141, 14,  |
| of the petrous ganglion, 62, 65                                 | the popliteus ninscle, 134   |
| petrosa, 62, 65   | the tibialis posticus muscle, 136  |
| rotunda, 66, 68   | of the tendous of the peroneal muscles, 138                                      |
| Fovea articularis ossis temporalis, 62                          | of the ulnar nerve, 112 vertebral (for vertebral artery), 29                     |
| superior atlantis, 29<br>capitis femoris, 132, 133              | vertebrar (tor vertebrar areery), 29   |
| capituli radii, 115   | H.   |
| costalis, inferior, 25  | Hamulus lacrimalis, 79, 98   |
| superior, 25  | ossis hamati, 118, 121   |
| transversalis, 25<br>dentis, 29                                 | pterygoideus, 58, 60, 95   |
| pterygoidea (processus condyloidei), 84, 85                     | Haversian canals, 10   |
| sublingualis, 85  | system of lamellæ, 10, 11 Head of the astragalus, 143                            |
| submaxillaris, 85   | of the capitate bone, 121  |
| trochlearis, 76   | of the femur, 132-134  |
| Foveolæ ethmoidales, 76<br>granulares [Pacchioni], 50, 73       | of the fibula, 138   |
| Frons, 46, 47   | of the humerus, 112  |
| Fundus meatus acustici interni, 65                              | of the inferior maxillary bone, 84-86, 96 of the mandible, 84-86, 96             |
| of the internal auditory meatus, 65                             | of the os magnum, 121  |
| G.  | of the radius, 115   |
| Geniculum of the aqueduct of Fallopius, 65, 67, 68              | of the scapula, 110  |
| canalis facialis, 65, 67, 68                                    | of the ulna, 114 Heads of the metacarpal bones, 112                              |
| "German horizontal," 101  | of the metatarsal bones, 141, 145  |
| Girdle, pelvic, 107, 124-126                                    | of the ribs, 40  |
| shoulder, 106, 108  | Heart, rudimentary, 102  |
| Glabella, 46, 74<br>Gladiolus, 41                               | Hiatus canalis facialis, 63-67   |
| Great wing of the sphenoid, 58-61                               | Fallopii, 63-67<br>maxillaris, 80, 91, 99  |
| Groove or grooves:  | of the sacrum, 31  |
| for Arnold's nerve, 62, 65                                      | semilunaris, 78, 90  |
| for the auricular branch of the pneumogastric<br>nerve, 62, 65  | subarcuatus, 63, 70  |
| basilar, 49, 56, 58   | Hip-bone, the, 107, 128-130<br>development of, 131                               |
| bicipital, 112  | Hook of the unciform bone, 118, 121  |
| carotid, 58, 59   | Horseshoe-shaped articular surface of the acetabulum, 13                         |
| fibular, 136, 137   | Humerus, the, 12, 106, 112   |
| of the hamular process, 58<br>infra-orbital, 80, 93, 94, 98, 99 | development of, 113  |
| interosseous, of the astragalus, 143                            |  |
| of the calcaneum, 143   | 71' (1   |
| of the tarsus, 143  | Iliac portion of the iliopectineal line, 128                                     |
| lachrymal, 98<br>of the lachrymal bone, 79, 92                  | Ilium, the, 19, 124-126 *Impressiones digitatæ, 49, 75, and notes, pp. 49 and 75 |
| of the superior maxillary bone, 80, 82,                         | Impression, rhomboid, 109  |
| 91, 98  | Impressio trigemini, 63  |
| meningeal, 50, 73   | Incisura vel incisuræ:   |
| of the middle temporal artery, 62<br>mylohyoid, 85              | acetabuli, 130<br>clavicularis, 41   |
| of the nasal nerve, 79, 91                                      | costales, 41   |
| obturator, 128  | ethmoidalis, 76, 77  |
| occipital, 62, 71   | fibularis, 136, 137  |
| optic, 59   | frontalis, 74, 76<br>ischiadica major, 128, 129                                  |
| palatine, 82, 97<br>anterior, 80, 91                            | minor, 129   |
| posterior, 80   | jugularis ossis occipitalis, 56, 89  |
| of the palate-bone, 83  | temporalis, 63   |
| of the sphenoid bone, 58, and                                   | sterni, 41   |
| note to same  | lacrimalis, 80   |
|   |  |
|   | •  |
|   |  |

| Incisura vel incisuræ:   | Line or lines:  |
|--|---|
| mandibulæ, 84  | curved, of the ilium, inferior, 129   |
| mastoidea, 62, 71  | middle, 129, 130  |
| nasalis, 80<br>parietalis, 62, 63  | superior, 129<br>of the occipital bone, highest, 55                             |
| radialis (ulnæ), 114   | inferior, 48, 55, 56  |
| scapulæ, 110   | superior, 55, 56  |
| senîilunaris, 114, 115<br>sphenopalatina, 83                                   | gluteal, inferior, 129<br>middle, 129, 130                                      |
| supra-orbitalis, 74, 76  | posterior, 129  |
| tympanica [Rivini], 62, 64, 70, 71   | iliopectineal, iliac portion, 128   |
| ulnaris (radii), 115<br>vertebralis inferior, 25, 27                           | pubic portion, 128<br>intercondylar, 132  |
| superior, 27   | intertrochanteric, anterior, 132, 133   |
| Inclination of the pelvis, 127   | posterior, 132, 133   |
| Infundibulum, 78   | oblique, external (of the inferior maxillary bone), 84,                         |
| Interparietal bone, note, p. 57 Ischium, the, 124-126                          | internal (of the inferior maxillary bone), 85                                   |
| Iter chordæ posterius, 64, 65, 67  | of the scapula, 110   |
|  | of the tibia, 136, 137  |
| J,   | pectineal, 132, 133<br>temporal, inferior, 47, 72                               |
| Jacobson's nerve, canal for, 65-67<br>Jaw-bone, lower, 46, 47, 53, 84-86       | superior, 47, 72  |
| development of, 86   | trapezoid, 109  |
| upper, 46, 47, 53, 80, 81  | Lingula mandibulæ, 84-86<br>sphenoidalis, 59, 99                                |
| development of, 82   | Lip of the crest of the ilium, inner, 128                                       |
| Jaws, senile atrophy of, 87<br>Juga alveolaria, 80, 85                         | outer, 129, 130   |
| cerebralia, 49, 75   | of the linea aspera, inner, 132, 133  |
| L.   | outer, 132, 133   |
| Labium externum (cristæ iliacæ), 129, 130                                      | DAI   |
| internum (cristæ iliacæ), 128  | M,  |
| laterale (lineæ asperæ), 132, 133<br>mediale (lineæ asperæ), 132, 133          | Malleolus, external, 137, 138   |
| Labyrinth, bony, 68, 69, 96  | internal, 136, 137<br>lateralis, 137, 138                                       |
| of the ethmoid bone, 78, 92, 94  | medialis, 136, 137  |
| osseous, 68, 69, 96<br>Labyrinthus ethuloidalis, 78, 92, 94                    | Mandibula, 46, 47, 53, 84-86  |
| osseous, 68, 69, 96  | development, 86  Manubrium sterni, 41   |
| Lachrymal canal, 93, 95  | Margin, alveolar, of the inferior maxillary bone, 84, 86                        |
| Lacunæ of bone, 10   | of the superior maxillary bone, 80-82, 97                                       |
| Lamina cribrosa, 78, 90, 91, 94<br>externa of the cranial bones, 19, <b>50</b> | of bicipital groove, inner, 112<br>outer, 112                                   |
| interna of the cranial bones, 19, 50   | supra-orbital, 48, 74, 76, 77, 92, 98   |
| lateralis processus pterygoidei, 58, 60, 61, 99                                | Margo axillaris (scapulæ), 110  |
| malaris (ossis zygomatici), 83<br>medialis processus pterygoidei, 58, 61       | dorsalis radii, 114, 115  |
| † orbitalis (ossis zygomatici), 83, 98   | frontalis ossis parietalis, 72, 73  |
| papyracea, 78, 91, 92, 94  | splienoidalis, 58, 59   |
| perpendicularis, 78, 91, 94, 95<br>of the vertebræ, 25, 26                     | infraglenoidalis (tibiæ), 136, 137  |
| Limbus alveolaris mandibulæ, 84, 86  | infra-orbitalis, 80, 83, 98<br>lacrimalis (maxillæ), 80                         |
| maxillæ, 80-82, 97   | lanıbdoideus, 54-56   |
| dentalis, 48 Linea vel lineæ:  | lateralis humeri, 112   |
| arcuata (ossis ilii), 128  | pedis, 140<br>mastoideus, 54-56   |
| aspera (femoris), 132, 133   | medialis humeri, 112  |
| glutæa anterior, 129, 130  | pedis, 140  |
| inferior, 129<br>posterior, 129  | tibiæ, 136, 138<br>nasalis (ossis frontalis), 76, 77                            |
| intercondyloidea (femoris), 132  | occipitalis ossis parietalis, 72, 73  |
| intermedia (cristæ iliacæ), 128, 130   | temporalis, 62, 63  |
| intertrochanterica, 132, 133<br>musculares (scapulæ), 110                      | † orbitalis (ossis sphenoidalis), 59 parietalis ossis frontalis, 74-76          |
| invlohvoidea, 85   | temporalis, 62, 63  |
| nuchæ inferior, 48, 55, 56   | † petrosus (ossis sphenoidalis), 59   |
| superior, 55, 56<br>suprema, 55  | sagittalis (ossis parietalis), 72, 73<br>† sphenoidalis ossis frontalis, 75, 76 |
| obliqua (mandibulæ), 84, 85  | temporalis, 62-64   |
| pectinea (femoris), 132, 133   | squamosus ossis parietalis, 72, 73  |
| poplitea, 136, 137<br>temporalis inferior, 47, 62, 72                          | spheuoidalis, 58-60<br>superior (scapulæ), 110                                  |
| (ossis frontalis), 46, 74, 77  | superior (scaputæ), 110<br>supra-orbitalis, 48, 74, 76, 77, 92, 98              |
| superior, 47, 72   | vertebralis (scapulæ), 110  |
| terminalis (pelvis), 124, 125<br>pars iliaca, 125                              | volaris radii, 114, 115   |
| pubica, 125  | ulnæ, 114<br>zygomaticus (ossis sphenoidalis), 58-60                            |
| sacralis, 30, 125  | Massa lateralia (atlantis), 20  |
| transversæ (ossis sacri), 30   | Masses, lateral (of the atlas), 29  |

| Mass, lateral, of the ethmoid bone, 78, 92, 94                                  |
|---|
| of the sacrum, 30, 31<br>Mastoid antrum, 64, 66, 67, 70                         |
| entrance to, 66, 67   |
| portion of the temporal bone, 62-64, 70, 71<br>Maxilla, the, 46, 47, 53, 80, 81 |
| development of, 82  |
| Meatus acusticus externus, 47, 66, 69, 71, 96<br>internus, 65, 68, 69, 96       |
| auditory, external, 47, 66, 69, 71, 96<br>internal, 65, 68, 69, 96              |
| nasal, common, 78, 96   |
| 111fer101, 90, 94<br>middle, 90, 94   |
| superior, 90, 94  |
| nasi communis, 78, 96<br>inferior, 90, 94                                       |
| medius, 90, 94  |
| superior, 90, 94<br>nasopharyngeal, 90  |
| nasopharyngeus, 90<br>Medulla ossium, 11  |
| Membrane of the anterior fontanelle, 104  |
| Mesosternum, 41   |
| Metacarpus, 106, 118<br>Metatarsus, 107, 140                                    |
| Metasternum, 41   |
| Nares, posterior, 48, 93, 96  |
| Nasal aperture, anterior, 46, 48, 90, 91, 93                                    |
| posterior, 48, 93, 96<br>Neck, anatomical, of the humerus, 112                  |
| of the astragalus, 143  |
| of the femur, 132-134<br>of the inferior maxillary bone, 84, 85                 |
| of the mandible, 84, 85   |
| of the radius, 115<br>of the scapula, 110                                       |
| surgical, of the humerus, 112   |
| Necks of the ribs, 40<br>†Norma frontalis, 46, 101                              |
| † lateralis, 47, 101  |
| t verticalis, 101 Notch, cotyloid, 130  |
| clavicular, 41  |
| ethmoidal, 76, 77<br>great sciatic, 128, 129                                    |
| iliosciatic, 128, 129   |
| interclavicular, 40<br>jugular, of the occipital bone, 56, 89                   |
| of the temporal bone, 63<br>lachrymal, 80                                       |
| nasal, 80   |
| parietal, 62, 63<br>popliteal, 137  |
| pterygoid, 58, 89   |
| of Rivinus, 62, 64, 70, 71<br>sciatic, 129                                      |
| sigmoid, 84   |
| small sciatic, 129<br>sphenopalatine, 83  |
| supra-orbital, 74, 76   |
| suprascapular, 110<br>vertebral, inferior, 25, 27                               |
| Superior, 27<br>Notochord, 34   |
| "Nutcracker face," 87   |
| Nutrient artery, 20   |
| Occiput, 47   |
| Odontoid process, 29  |
| Olecranon, 114, 115<br>Optic vesicle, primary, 102                              |
| Orbit, entrance to the, 48, 98 Orbital orifice, height, 101                     |
| Orbital orifice, height, 101 width, 101   |
| Orbitosphenoid, 61  |
| Orbits, the, 92-95, 98<br>Orifice of the Eustachian tube, tympanic, 66          |

Os vel ossa: acetabuli, 131 antibrachii, 106, 114-110 development of, 117 brevia, 16, 17 development of, 21 capitatum, 119-121 calcis, 17, 142, 143 development of, 146, 147 carpi, 120, 121 development of, 123 centrale carpi, 120 coccygis, 24, 32, 33, 125, 120 development of, 35 costale, 38, 39 coxæ, 107, 128-130 development of, 13: cranii, 52-104 cerebralis, 52 crnris, 107, 136-138 development of, 139 cuboideum, 142, 144 cuneiforme primum, 141, 142, 144 secundum, 142, 144 tertium, 17, 142, 144 ethmoidale, 52, 78 faciei, 53 frontale, 52, 74-76 development of, 77 hamatum, 119-121 hyoideum, 87 ilium, 19, 124-126 incæ, 100 incisivum, 82, 97 infracoracoideum, 111 innominatum, 107, 128-130 development of, 131 interparietale, 100 ischii, 124-126 lacrimale, 53, 79, 90-92, 95 longa, 12-15 lunatum, 119, 120 magnum, 119-121 metacarpale I., 106, 119 metacarpalia, 119, 122 development of, 123 metatarsale I., 107, 142 metatarsalia, 142, 145 development of, 146, 147 multangulum majus, 119-121 minus, 119-121 nasale, 53, 79, 90, 91 naviculare manus, 119, 120 pedis, 142, 144 occipitale, 52, 54-56 development of, 57 palatinum, 53, 83 parietale, 19, 52, 72, 73 development of, 21 pisiforme, 118-120 planum, 78, 91, 92, 94 plana, 19 pubis, 124-126 sacrum, 24, 30-33, 125, 126 development of, 35 sesamoidea manus, 118 pedis, 140, 141 sphenoidale, 52, 58-60 development of, 51 suprasternalia, 41 suturarum, 100 tarsi, 17, 143, 144 temporale, 52, 62-69 development of, 70, 71 trigonum, 143 triquetrum, 119, 120 zygomaticum, 53, 83 "Osseous corpuscles," 10 Ossification, intracartilaginous, 20 intramembranous, 21

20a

| Ossification of the Y-shaped cartilage of the acetabulum, 131 Osteology, 7 et seq. | Portion, nasal, of the frontal bone, 74, 77<br>Porus acusticus externus, 47, 48, 62 |
|--|---|
| Ostium tympanicum tubæ auditivæ, 66  | internus, 63, 65, 68, 70  |
| D.   | Postsphenoid, 61  |
| Paterto hard 48 04 06 07   | Premaxilla, 82, 97  |
| Palate, hard, 48, 94, 96, 97<br>Palatum durum, 48, 94, 96, 97                      | Presternum, 41  |
| Paries carotica cavi tympani, 65, 66   | Process or processes:   |
| inferior orbitæ, 93, 98, 99  | accessory, 27   |
| jugularis cavi tympani, 66   | alar, 78, 94  |
| labyrinthica cavi tympani, 65, 66  | articular, of the sacrum, superior, 30-32   |
| lateralis orbitæ, 98<br>mastoidea cavi tympani, 66                                 | of the vertebræ, inferior, 25-27, 29<br>superior, 25-27, 29                         |
| medialis orbitæ, 98  | * of the astragalus, external, 143  |
| superior orbitæ, 92, 98  | posterior, 141, 143   |
| tegmentalis cavi tympani, 65   | trochlear, 143  |
| Pars alveolaris mandibulæ, 84-86<br>basilaris ossis occipitalis, 54-57             | basilar, of the occipital bone, 54-57, 60   |
| cupularis recessus epitympanici, 64  | middle, 59, 60  |
| horizontalis ossis palatini, 83, 90, 91, 97  | posterior, 58, 59   |
| lateralis ossis occipitalis, 54, 56, 57  | cochleariform, 64-68  |
| sacri, 30, 31  | coracoid, 110, 111  |
| mastoidea ossis temporalis, 62-64, 70, 71<br>nasalis ossis frontalis, 74, 77       | coronoid (of the mandible), 84, 86<br>(of the ulna), 114                            |
| orbitalis ossis frontalis, 75-77, 94, 98   | costal, 27  |
| perpendicularis ossis palatini, 83, 90, 91, 97, 99                                 | ensiform, 41  |
| petrosa ossis temporalis, 62-64, 70, 71  | ethmoidal, 79, 90   |
| tympanica ossis temporalis, 62, 64, 65, 71   | of frontal bone, external angular, 75-77  |
| Patella, 107, 136 Pecten ossis pubis, 128  | humular, of the lachrymal bone, 79, 98 of the sphenoid bone, 58, 60, 95             |
| Pedicle of the neural arch, 25, 26   | intrajugular, of the occipital bone, 63   |
| Pelvic brim or inlet, 124, 125, 127  | of the temporal bone, 56  |
| girdle, 107, 124-126   | jugular, 54, 56, 89   |
| outlet, 126, 127<br>Pelvis, 124, 127   | lachrymal, 79, 90<br>of the malar bone, frontal, 83                                 |
| axis of, 127   | marginal, 83  |
| diameters of, 127  | orbital, 83, 98   |
| false, 124, 125  | temporal, 83  |
| female, 124  | mamillary, 27   |
| major, 124, 125<br>male, 125, 126  | mastoid, 48, 62, 64, 67, 71, 88   |
| measurements of, 127   | maxillary, of the inferior turbinate bone, 79 99 nasal, of the palate bone, 83, 99  |
| minor, 124, 125, 127   | of the maxillary bone (inferior), alveolar, 84-86                                   |
| muliebris, 124   | coronoid, 84-86   |
| true, 124, 125, 127<br>virilis, 125, 126   | (superior), alveolar, 80, 82, 99  |
| Perichondrium, 20  | malar, 80, 82<br>nasal, 80, 81, 91  |
| Periosteum, 11, 20   | palatine, 80-82, 90,  |
| Petrosal ganglion, depression for, 62, 65  | 91, 97  |
| Petrous portion of the temporal bone, 62-64, 67, 70, 71                            | odontoid, 29  |
| Phalanges digitorum manus, 106, 118, 119, 122<br>development of, 123               | of the palate bone, orbital, 83, 90-92, 98, 99                                      |
| pedis, 107, 140-142, 145   | pyramidal, 83, 97, 99<br>sphenoidal, 83, 90, 91                                     |
| development of, 146, 147   | paramastoid, 88   |
| hallucis, 107  | paroccipital, 88  |
| pollicis, 106 Phologogy of the furgers 106 118 110 122                             | pterygoid, 48, 58-61, 91, 92  |
| Phalanges of the fingers, 106, 118, 119, 122<br>development of, 123                | pterygospinous, 60, 91<br>spinous, of the sphenoid bone, 58-61, 93                  |
| of the great toe, 107  | (of vertebræ), 25-27  |
| of the thumb, 106  | styloid, of the fibula, 138   |
| of the toes, 107, 140-142, 145   | of the radius, 115  |
| development of, 146, 147 Pit, olfactory, 102                                       | of the temporal bone, 48, 62, 64  |
| Plane, nuchal, 48, 55, 100   | of the third metacarpal bone, 122 of the ulna, 114, 115                             |
| occipital, 55, 100   | transverse, 25, 26, 28  |
| Planum nuchale, 48, 55, 100  | tympanic, anterior, 70, 71  |
| occipitale, 55, 100  | posterior, 70   |
| popliteum, 132<br>sternale, 36   | unciform, of the unciform bone, 118, 121  |
| temporale, 47, 72  | uncinate, 78, 90, 94, 95, 99<br>ungual, of the phalanges of the fingers, 122        |
| Plate, cribriform, 78, 90, 91, 94<br>of the ethmoid bone, orbital, 78, 91, 92, 94  | of the toes, 141, 145   |
| of the ethmoid bone, orbital, 78, 91, 92, 94                                       | vaginal, of the sphenoid bone, 58, 59, 61, 90, 91                                   |
| vertical, 78, 91, 94, 95<br>of the frontal bone, orbital, 75-77, 94, 98            | of the temporal bone, 64, 70, 71  |
| of the palate bone, horizontal, 83, 90, 91, 97                                     | xiphoid, 41   |
| palate, 83, 90, 91, 97   | Processus accessorius, 27<br>alaris, 78, 94   |
| vertical, 83, 90, 91, 97, 99   | alveolaris (maxillæ), 80, 82, 99  |
| pterygoid, external, 58, 60, 61, 99  | articularis inferior vertebrarum, 25-27, 29   |
| internal, 58, 61<br>tympanic, 62, 64, 65, 71                                       | superior ossis sacri, 30-32   |
| Ponticulus promontorii, 67   | vertebrarum, 25-27, 29  |

| Processus clinoideus, medius, 59, 60                              | Ramus of the pubis, ascending, 128  |
|---|---|
| posterior, 58, 59   | descending, 128, 130  |
| cochleariformis, 65, 66, 68<br>condyloideus, 84, 85               | inferior, 128, 130<br>superior, 128   |
| coracoideus, 110, 111   | superior ossis ischii, 128  |
| coronoideus mandibulæ, 84-86                                      | pubis, 128  |
| ulnæ, 114   | Recess, elliptical, 69  |
| costarius, 27   | epitympanic, 64, 69, 70   |
| ethmoidalis, 79, 90   | splieno-ethnioidal, 90, 92  |
| frontalis, 80, 81, 91   | Recessus ellipticus, 69 epitympanicus, 64, 69, 70                                       |
| frontosphenoidalis, 83<br>intrajugularis ossis occipitalis, 56    | spheno-ethmoidalis, 90, 92  |
| temporalis, 63  | Ribs, the, 36-40  |
| jugularis, 54, 56, 89   | asternal, 36, development of, 42  |
| lacrimalis, 79, 90  | false, 36   |
| lateralis tali, 143   | floating, 36<br>sternal, 36   |
| tuberis calcanei, 141, 143<br>mamillaris, 27                      | true, 36  |
| marginalis, 83  | Ridge or ridges:  |
| mastoideus, 48, 62, 64, 67, 71, 88                                | of the carpus, radial, 118  |
| maxillaris, 79, 99  | ulnar, 118  |
| medialis tuberis calcanei, 141, 143                               | * cruciform, internal, 54   |
| nasalis ossis palati, 83, 99<br>orbitalis, 83, 90-92, 98, 99      | for the interarticular costocentral ligament, 40  |
| palatinus, 80-82, 90, 91, 97                                      | intermediate, of the crest of the ilium, 128, 130                                       |
| paramastoideus, 88  | interosseous, of the fibula, 138  |
| posterior tali, 141, 143  | of the tibia, 136-138   |
| pterygoideus, 48, 58-61, 91, 92                                   | intertrochanteric, 132, 133   |
| pterygospinosus [Civinini], 60, 91                                | mylohyoid, 85<br>of the neck of the rib, 40   |
| pyramidalis, 83, 97, 99<br>sphenoidalis, 83, 90, 91               | orbital, 80, 98   |
| spinosus, 25-27   | pectoral, 112   |
| styloideus ossis metacarpalis III., 122                           | postauricular, 62   |
| temporalis, 48, 62, 64  | superciliary, 46, 48, 74  |
| radii, 115  | supinator (of the ulna), 114<br>transverse, of the sacrum, 30                           |
| ulnæ, 114, 115<br>temporalis, 83                                  | of the trapezium, 118, 121  |
| transversus, 25, 26, 28   | trapezoid, 109  |
| troclilearis, 143   | Ring, tympanic, 70, 103, 104  |
| tympanicus, anterior, 70, 71                                      | Roof of the skull, 50 of the tympanum, 65   |
| posterior, 70<br>uncinatus, 78, 90, 94, 95, 99                    | Rostrum, sphenoidal, 58-61, 91  |
| vaginalis, 58, 59, 61, 90, 91                                     | primitive, 61   |
| xiphoideus, 41  | Row of teeth, 48  |
| zygomaticus maxillæ, 80, 82                                       | S.  |
| ossis frontalis, 75-77<br>temporalis, 62-64, <b>70, 7</b> 1       | Sacrum, the, 24, 30-33, 125, 126<br>development of, 35                                  |
| Prominence of the aqueduct of Fallopius, 66                       | apex of the, 30, 31   |
| of the external semicircular canal, 66, 67                        | Scapula, the, 106, 108, 110   |
| styloid, 64   | development of, III   |
| Prominentia canalis facialis, 66 semicircularis lateralis, 66, 67 | Sella turcica, 60, and footnote<br>Semicanalis musculi tensoris tympani, 64, 66, 67, 70 |
| styloidea, 64   | tubæ auditivæ, 64, 66, 67, 69   |
| Promontorium (cavi tympani), 66-68                                | Septa, interalveolar, 82, 84  |
| (columnæ vertebralis), 24, 124                                    | Septum between the canal for the tensor tympani muse                                    |
| Promontory of the tympanum, 66-68 sacral, 24, 124                 | and the Eustachian canal, 64-68   |
| Protovertebræ, 34   | canalis musculotubarii, 64, 66, 67<br>of the frontal sinuses, 76, 94                    |
| Protuberance, mental, 84-86                                       | nasi osseum, 46, 91-93, 96  |
| occipital, external, 48, 55, 56                                   | of the nose, bony, 46, 91-93, 96  |
| internal, 49, 54, 57, 89  | sinuum frontalium, 76, 94   |
| Protuberantia mentalis, 84-86                                     | sphenoidalium, 60, 93   |
| occipitalis externa, 48, 55, 56<br>interna, 49, 54, 57, 89        | sphenoidal, 60, 93<br>Shaft of the femur, 132, 133                                      |
| Pterygoid plate, external, 58, 60, 61, 99                         | of the fibula, 138  |
| internal, 58, 61  | of the humerus, 112   |
| Publs, the, 124-126 Pyramid of the tympanum, 66, 67, 69           | of the radius, 115  |
| Pyramis [pars petrosa] ossis temporalis, 62-64, 70, 71            | of the tibia, 136, 137<br>of the ulna, 114  |
| -)  | Shafts of the metacarpal bones, 122   |
| R,  | of the metatarsal bones, 145  |
|   | of the phalanges of the fingers, 122  |
| Radius, 13, 106, 115, 116 development of, 117                     | of the toes, 145  |
| Radix arcus vertebræ, 25, 26                                      | Shoulder-girdle, 106, 108   |
| Ramus, inferior ossis ischii, 128, 130                            | Sinciput, 47  |
| pubis, 128, 130   | †Sinus cervicalis, 102  |
| of the ischium, inferior, 128, 130<br>superior, 128               | frontalis, 76, 77, 90, 91, 94, 95<br>maxillaris, 80-82, 93-95, 97, 99                   |
| mandibulæ, 84-87  | posterior (cavi tympani), 64, 66, 67  |

|         | sphenoidalis, 60, 61, 90-93  | Spine, tympanic, anterior, 64, 71  |
|---------|--|--|
|         | tarsi, 140   | posterior, 64, 70, 71 *Spines, palatine, 82, 97                                  |
|         | tympani, 66, 67<br>on, appendicular, 105-147                           | Spongy bone, sphenoidal, 58, 59, 61  |
|         | axial, 23-104  | Squama frontalis, 74-77  |
|         | extremitatis inferioris, 105, 107, 124-147                             | occipitalis, 54-57   |
|         | superioris, 105, 106, 108-123<br>of the foot, 140-142                  | temporalis, 62-64, 70, 71 Squamous portion of the frontal bone, 74-77            |
|         | development of, 146, 147   | of the occipital bone, 54-57   |
|         | of the hand, 118, 119  | of the temporal bone, 62-64, 70, 71  |
|         | development of, 123  | Sternum, 41 development of, 42   |
|         | of the lower limb, 105, 107, 124-127                                   | Subiculum promontorii, 67  |
| †       | manus, 118, 119  | Substance of bone, cortical, 19, 20  |
| _       | development of, 123  | Substantia compacta, 11-17, 19   |
| T       | pedis, 140-142<br>development of, 146, 147                             | corticalis, 19, 20<br>spongiosa, 11-17, 19                                       |
|         | trunci, 23-43  | Sulcus vet sulci:  |
|         | of the trunk, 23-43  | arteriæ occipitalis, 62, 71  |
| Skn11   | of the upper limb, 105, 106, 108-123 (see also "Cranium"):             | temporalis mediæ, 62<br>vertebralis, 29  |
|         | cap, 50  | arteriosi, 50, 73  |
| 1       | nieasurements of, 101  | calcanei, 143  |
| 1       | views of:  | canaliculi mastoidei, 62, 65<br>caroticus, 58, 59                                |
|         | hase, external, 48<br>internal, 49                                     | carpi, 118   |
|         | front, 46, 101   | chiasmatis, 59   |
|         | roof, inner, 50  | costæ, 40  |
|         | side, 47, 101<br>top, 101  | ethmoidalis, 79, 91<br>hamuli pterygoidei, 58                                    |
| Small   | wing of the sphenoid, 58-61  | infra-orbitalis, 80, 93, 94, 98, 99  |
| Space,  | interosseous, of the forearm, 106, 116                                 | intertubercularis, 112   |
| C       | of the leg, 107  | lacrimalis maxillæ, 80, 82, 91, 98   |
|         | s, intercostal, 36<br>intercostalia, 36                                | ossis lacrimalis, 79, 92<br>lateral, 49, 54, 56, 63, 64, 73, 88, 89              |
| ‡Spatiu | m interosseum antibrachii, 106, 116                                    | longitudinal, 54, 73, 75, 88, 89   |
| †       | cruris, 107  | mallei, 70   |
| Sphen   | oid bone, 58-60<br>development of, 61                                  | malleolaris (tibiæ), 136<br>musculi flexoris ballucis longi (calcanei), 141, 143 |
| Spina   | vel spinæ:   | (tali), 141, 143   |
| -       | angularis, 58-61, 93   | peronæi longi (calcanei), 143  |
| t       | ethnioidalis, 59   | (ossis cuboidei), 140, 141, 14   |
|         | frontalis, 74-77, 90, 91 iliaca anterior inferior, 128, 129            | nervi petrosi superficialis majoris, 63, 64                                      |
|         | superior, 128-130  | minoris, 63, 64  |
|         | posterior inferior, 128, 129   | radialis, 112  |
|         | superior, 128, 129 ischiadica, 128, 129                                | spinalis, 26<br>ulnaris, 112   |
|         | mentalis, 84, 85, 96   | obturatorius, 128  |
| †       | musculi recti lateralis, 58  | olfactorius, 90  |
|         | nasalis anterior, 46, 47, 80, 90, 91, 93, 97<br>posterior, 90, 91, 97  | palatini, 82, 97<br>paraglenoidalis, 128   |
|         | palatinæ, 82, 97   | petrosal, inferior, 56, 62, 63, 88   |
|         | scapulæ, 110   | superior, 63   |
|         | suprameatum, 62  | petrosquamosus, 64   |
|         | trochlearis, 76, 98<br>tympanica major, 64, 71                         | petrosus inferior, 88 ossis occipitalis, 56                                      |
|         | minor, 64, 70, 71  | temporalis, 62, 63   |
| Spine,  | ethmoidal, of the sphenoid bone, 59                                    | superior, 63   |
|         | iliac, anterior inferior, 128, 129<br>superior, 128-130                | † præauricularis, 128<br>promontorii, 67   |
|         | posterior inferior, 128, 129   | † pterygopalatinus maxillæ, 80   |
|         | superior, 128, 129   | ossis palatini, 83   |
|         | of the ischium, 128, 129   | sphenoidalis, 58<br>sagittalis (ossis frontalis), 75, 88                         |
|         | for the lower head of the external rectus muscle of<br>the eyeball, 58 | (ossis occipitalis), 75, 66  |
|         | mental, 84, 85, 96   | (ossis parietalis), 73   |
|         | nasal, anterior, of the superior maxillary bone, 46,                   | sigmoideus, 49, 56, 63, 64, 88, 89   |
|         | 47, 90, 91, 93, 97<br>of the frontal bone, 74-77, 90, 91               | subclaviæ, 40<br>tali, 143   |
|         | posterior, 90, 91, 97  | transversus ossis occipitalis, 49, 54, 56, 89                                    |
|         | palatine, 90, 91, 97   | parietalis, 73   |
|         | peroneal, of the astragalus, 143                                       | tubæ auditivæ, 48  |
|         | pharyngeal, 56<br>pubic, 130   | tympanicus, 64, 66, 69, 70<br>venosus, 50  |
|         | of the scapula, 110  | Supra-occipital bone, note to p. 57  |
|         | of the sphenoid bone, 58-61, 93  | portion of the occipital bone, 54-57, an   |
|         | suprameatal, 62 of the tibia, 136, 137                                 | Surface, articular, of the astragalus, superior, 143                             |
|         | trochlear, 76, 98  | of the external malleolus, 137, 138  |

160d INDEX

| Surface | articular, of the head of the fibula, 138                                   | Surface, of the ulna        |  |           |
|---------|---|-----------------------------|--|-----------|
|         | of the internal malleolus, 137  |                             | internal, 114                                  |           |
|         | of the patella, 136<br>of the radius, for the ulna, 115                     | of the vert                 | posterior, 114<br>ical plate of the palate-bon | a autama1 |
|         | of the tibia, for the head of the fibula,                                   | of the vert                 | icar prace of the parate-bon                   | internal, |
|         | 136, 137  |                             |  | nasal, 83 |
|         | inferior or distal, 137   | zygomatic,                  | , 58-61, and note, p. 59                       | 14341, 03 |
|         | superior or proximal, 137   | Sustentaculum tali,         | , 140, 141, 143                                |           |
|         | auricular, of the ilium, 128  | Sutura coronalis, 46        | 6, 47, 49, 50, 88, 100                         |           |
|         | of the sacrum, 31, 32   |                             | iaxillaris, 98                                 | •         |
|         | of the femur, anterior, 132, 133  | frontalis, 77               |  |           |
|         | patellar, 132-134<br>popliteal, 132   | frontolacrin                | oidalis, 49, 98                                |           |
|         | postero-external, 132, 133  | frontonaxil                 |  |           |
|         | postero-internal, 132, 133  | incisiva, 48,               |  |           |
|         | of the fibula, anterior,  | infra-orbital               |  |           |
|         | , external, 138   | intermaxilla                |  |           |
|         | internal, 138   | ' internasalis,             | 46, 92   |           |
|         | posterior, 138  | lacrimocone                 | halis, 90, 95                                  |           |
|         | of the foot, dorsal, 140  |                             | moidalis, 91, 98                               |           |
|         | plantar, 141  | lacrimomax                  | illaris, 91, 98                                |           |
|         | of the frontal bone, anterior, 74   | lambdoidea,                 | 47, 50, 89, 100                                |           |
|         | cerebral, 75<br>frontal, 74   | † mendosa, 55               | s, 46, 90-92, 98                               |           |
|         | orbital, 76   | nasomaxilla                 |  |           |
|         | posterior, 75   |                             | ransversa, 100                                 |           |
|         | temporal, 74, 77  |                             | toidea, 47-49, 88, 89, 100                     |           |
|         | of the great wing of the sphenoid bone, cerebral,                           | palatina med                | diana, 96, 97                                  |           |
|         | 58, 61  | tran                        | nsversa, 90, 91, 96, 97                        |           |
|         | of the great wing of the sphenoid bone, orbital,                            | palato-ethm                 |  |           |
|         | 58-61, 98   | palatomaxill                | laris, 98                                      |           |
|         | of the great wing of the sphenoid bone, spheno-                             | parietomasto                | oidea, 47, 49, 89, 100                         |           |
|         | maxillary, 58, 99 of the great wing of the sphenoid hone, temporal,         | sagittalis, 50              | , 65, 160<br>10idalis, 49, 98, 99              |           |
| •       | 58-61, and note, p. 59  | sphenofronta                | alis. 47                                       |           |
|         | of the hand, dorsal, 119  | spheno-orbit                |  |           |
|         | palmar, 118   |                             | talis, 46, 47, 88                              |           |
|         | of the humerus, antero-external, 112  | sphenosquar                 | 110sa, 46-49, 88                               |           |
|         | antero-internal, 112  |                             | matica, 47, 98                                 |           |
|         | posterior, 112  | squamosa, 46                |  |           |
|         | of the malar bone, malar, 83<br>orbital, 83                                 |                             | astoidea, 62, 70, 71                           |           |
|         | outer, 83   | zygomaticon                 | rontalis, 46, 47, 92<br>naxillaris, 46, 47     |           |
|         | temporozygomatic, 83  |                             | emporalis, 46, 47                              |           |
|         | patellar (of the femur), 132-134  | Suture, coronal, 46,        | 47, 49, 50, 88, 100                            |           |
|         | of the parietal hone, cerebral, 73  | ethmoidoms                  | axillary, 98                                   |           |
|         | external, 72  | frontal, 77                 |  |           |
|         | internal, 73  | ironto-ethm                 | ioidal, 49, 98                                 |           |
|         | parietal, 72<br>temporal, 47, 72  | frontolaehry                | mai, 91, 98                                    |           |
|         | of the petrous portion of the temporal bone,                                | frontomalar<br>frontomaxil  |  |           |
|         | anterior, 65  |                             | al, 46, 47, 49, 50, 88, 100                    |           |
|         | of the petrous portion of the temporal bone,                                | infra-orbital               | , 80   |           |
|         | inferior, 65  | intermaxilla                |  |           |
|         | of the petrous portion of the temporal bone,                                | interparietal               | 1, 50, 88, 100                                 |           |
|         | posterior, 65   | internasal, 4               | 16, 92   |           |
|         | poplitea!, 132  |                             | hmoidal, 91, 98                                |           |
|         | of the pubic symphysis, 128<br>of the radius, anterior, 114-116             | lachrymoma                  | axillary, 91, 98<br>rbinal, 90, 95             |           |
|         | external, 114-116   | lambdoid, 4                 | 7 50 80 100                                    |           |
|         | posterior, 114-116  | malomaxilla                 | 1, 50, 69, 100                                 |           |
|         | of the sacrum, dorsal, 31, 32   |                             | , 57, 104, and note to p. 5?                   |           |
|         | pelvic, 30, 32, 125   | metopic, 77                 |  |           |
|         | posterior, 126  | nasofrontal,                | 46, 90-92, 98                                  |           |
|         | of the scapular, anterior, 110  | nasomaxilla                 | ry, 46, 67                                     |           |
|         | posterior, 110  | occipital, tra              | ansverse, 55, 57, 100, 104,                    | and note  |
| (       | of the squamous portion of the temporal bone,                               | P: 57                       | toid 4m 40 00 00 100                           |           |
|         | cerebral, 63, 64 of the squamous portion of the temporal bone,              |                             | toid, 47-49, 88, 89, 100                       |           |
|         | temporal, 62, 63  | palatine and                | etal, 47, 50, 89, 100<br>terior, 48, 82, 97    |           |
|         | of the sternum, anterior, 36  |                             | edian, 96, 97                                  |           |
|         | of the superior maxillary bone, anterior, 80                                |                             | ddle, 96, 97                                   |           |
|         | facial, 80  | pos                         | sterior, 90, 91, 96, 97                        |           |
|         | nasal, 80   | tra                         | nsverse, 90, 91, 96, 97                        |           |
|         | orbital, 80   | palato-ethm                 |  |           |
|         | zygomatic, 80, 99   | palatomaxil                 | lary, 98                                       |           |
|         | temporozygomatic, 58-61, and note, p. 59<br>of the tibia, external, 136-138 | parietomasto                | oid, 47, 49, 89, 100                           |           |
|         | internal, 136, 138  | petrospheno<br>premaxillary |  |           |
|         | posterior, 136-138  | sagittal, 50, 8             |  |           |
|         |   | 0 .07                       |  |           |

| Suture, spheno-ethmoidal, 49, 98, 99   | Tubercle of the tibia, 136, 137                               |
|--|---|
| sphenofrontal, 47  | of the tuberosity of the calcaneum, inner, 141, 143           |
| sphenomalar, 47, 98  | Outer, 141, 143   |
| splieno-orbital, 49, 98  | Tuberculum anterius atlantis, 29 vertebrarum cervicalium, 26  |
| sphenoparietal, 46, 47, 88<br>sphenosquamous, 46-49, 88  | articulare, 62  |
| squamosomastoid, 62, 70, 71  | caroticum, 24   |
| squamous, 46-48  | costæ, 37, 40   |
| temporomalar, 46, 47   | intercondyloideum laterale, 137                               |
| Symphysis ossium pubis, 125  | mediale, 137<br>jugulare, 54, 56                              |
| pubic, 125<br>Synchondrosis epiphyseos, 20   | † laterale tali, 143  |
| intersplienoidalis, 61   | majus, 112  |
| intra-occipitalis, anterior, 57  | t mediale tali, 143   |
| posterior, 57  | mentale, 84, 85, 96   |
| occipitosphenoidal, 49   | minus, 112<br>obturatorium anterius, 128                      |
| spheno-occipitalis, 49<br>sternalis, 41  | posterius, 128, 130   |
| Dick and and a second s | ossis multanguli majoris, 118, 121                            |
| T.   | navicularis manus, 118, 120                                   |
|  | pliaryngeum, 56   |
| Table, inner, of the bones of the skull, 19, 50<br>of the frontal bone, 75-77  | posterius atlantis, 29<br>vertebrarum cervicalium, 26, 29     |
| outer, of the bones of the skull, 19, 50   | pubicum, 130  |
| of the frontal bone, 75, 76  | scaleni [Lisfranci], 40                                       |
| Tabular portion of the occipital bone, 54-57, and note,  | sellæ, 59-61  |
| p. 57  | Tuberositas coracoidea, 109                                   |
| Talûs, 17, 142, 143<br>Tarsus, 107, 140  | costæ II., 40<br>costalis, 109                                |
| Tegmen tympani, 64, 65, 69-71, 96  | deltoidea, 112  |
| Thorax, 36, 37   | olutæa. 122   |
| Tibia, 15, 18, 107, 136, 137   | iliaca, 128, 129  |
| development of, 139  | infraglenoidalis, 110   |
| Tissue of bone, cancellous, 11-17, 19<br>compact, 11-17, 19  | niasseterica, 84, 86<br>ossis cuboidei, 141, 144              |
| Toes, skeleton of, 140, 141  | nietacarpalis V., 122   |
| Tooth-sockets of the lower jaw, 84   | metatarsalis I., 141, 145                                     |
| of the upper jaw, 82   | V., 140, 141, 145   |
| Torus occipitalis, 100   | navicularis pedis, 140, 141, 144                              |
| palatinus, 96 Tractus spiralis foraminulentus, 68  | pterygoidea, 85<br>radii, 115, 116                            |
| Trapezium, the, 119-121  | sacralis, 31  |
| Trochanter, great, 132-134   | supraglenoidalis, 110   |
| major, 132-134   | tibiæ, 136, 137   |
| minor, 132, 133  | ulnæ, 114   |
| small, 132, 133<br>tertius, 133  | unguicularis phalangum digitorum (manus),                     |
| third, 133   | unguicularis phalangum digitorum pedis, 141,                  |
| Trochlea humeri, 112   | 145   |
| phalangis manus, 120   | Tuberosity, costal, 109                                       |
| pedis, 145   | of the cuboid hone, 141, 144 of the femur, external, 132, 134 |
| tali, 140, 143<br>Tuber calcanei, 140, 141, 143, 147   | internal, 132, 134  |
| cochleæ, 66-68   | of the fifth metacarpal bone, 122                             |
| frontale, 46, 74, 77, 104  | of the first metatarsal bone, 141, 145                        |
| ischiadicum, 128-130   | of the fifth metatarsal bone, 140, 141, 145                   |
| maxillare, 80-82, 99<br>parietale, 72, 104   | of the humerus, great, 112<br>small, 112                      |
| Tubercle of the atlas, anterior, 29  | of the ilium, 128, 129  |
| posterior, 29  | masseteric, 84, 86  |
| carotid, 24  | of the navicular bone, 140, 141, 144                          |
| of the cervical vertebræ, anterior, 26   | of the os calcis, 140, 141, 143, 147                          |
| posterior, 26, 29<br>conoid, 109   | of the palate-bone, 83, 97, 99<br>pterygoid, internal, 85;    |
| infraglenoid, 110  | of the radius, 115, 116                                       |
| of the ischium, 128-130  | of the sacrum, 31   |
| of Lisfranc, 40  | of the scaphoid bone, 118, 120                                |
| mental, 84, 85, 96   | of the superior maxillary hone, 80-84, 99                     |
| obturator, anterior, 128<br>posterior, 128, 130  | of the tibia, external, 136, 137<br>internal, 136, 137        |
| pharyngeal, 56   | of the trapezium, 118, 121                                    |
| of the posterior process of the astragalus,  | of the ulua, 114  |
| external, 143  | Turbinate bone, sphenoidal, 58, 59, 61                        |
| of the posterior process of the astragalus,  | orbital border of the, 59                                     |
| of the ribs, 37, 40  | Tympanic plate, 62, 64, 65, 71<br>ring, 70, 103, 104          |
| scalene, 40  | sinus, 66, 67   |
| of the spine of the tibia, inner, 137  | spine, anterior, 64, 71                                       |
| outer, 137   | posterior, 64, 70, 71   |
| Sumagrenoro, 110   | SHICHS DA DD DO 70  |

Vertex, 46, 47

Ulna, the, 13, 106, 114, 116
development of, 117

V.

Vaginal process of the temporal bone, 64, 70, 71
of the sphenoid bone, 58, 59, 61, 90, 91

Vagina processus styloidei, 64, 70, 71
Venter of the scapula, 110

Vertebra or vertebræ:
cervical, 24, 26, 29
seventh, 29
development of, 34, 55
dorsal, 24, 25, 28
first, 28
eleventh, 28
twelfth, 28
lumbar, 24, 27, 28
fifth, 28, 33
prominens, 24
sacral, 24, 30-32
structure, 16
thoracales, 24, 25, 28
thoracalis I., 28
XI., 28
XII., 28
XII., 28

Vesicle, optic, primary, 102
umbilical, 102
Vestibulum labyri thi, 65, 68, 69
Vomer, 53, 79, 91, 94, 95

W.

Wall of the orbit, external, 98
inferior, 93, 98
internal, 98
superior, 92, 98
of the tympanum, carotid, 65, 66
inner, 65, 66
jugular, 66
labyrinthine, 65, 66
mastoid, 66
superior (roof), 65

Wing of the ilium, 130
of the sphenoid, great, 58-61
small, 58-61

X.

Xiphisternum, 41

Zygoma, 46-48, 62-64, 70, 71, 96 'Zygomatic width,' 101

# AN ATLAS

OF

# HUMAN ANATOMY

FOR STUDENTS AND PHYSICIANS

BY

CARL TOLDT, M.D.

ASSISTED BY

PROFESSOR ALOIS DALLA ROSA, M.D.

Adapted to English and American and International Terminology

BY

M. EDEN PAUL, M.D. BRUX., M.R.C.S., L.R.C.P.

### SECOND SECTION

C. ARTHROLOGY
(FIGURES 378 TO 489 AND INDEX)
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## SYNDESMOLOGIA ARTHROLOGY



THE ARTICULATIONS IN GENERAL

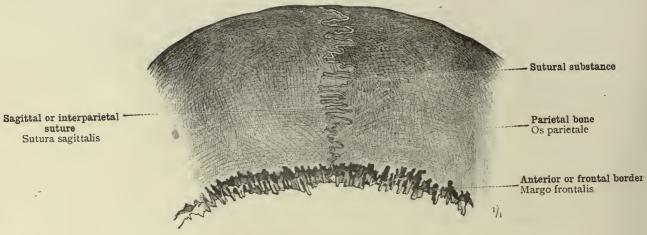


Fig. 378.—Sutura Serrata—Serrated or Dentated Suture.

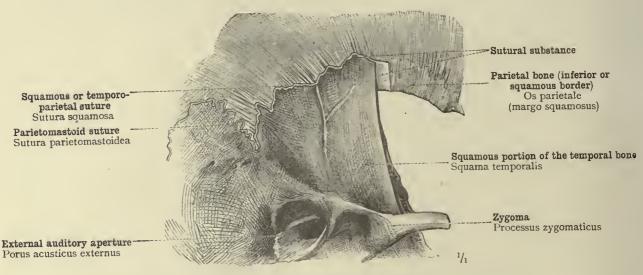


Fig. 379.—Sutura Squamosa—Squamous or Scaly Suture.

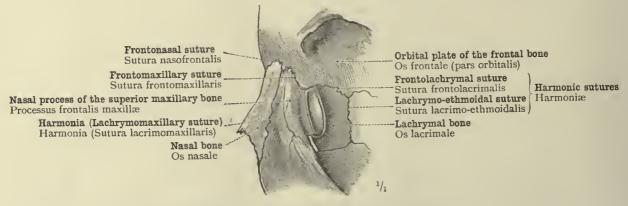


FIG. 380.—HARMONIA—HARMONIC SUTURE.

Synarthrosis, or Continuous Articulation.

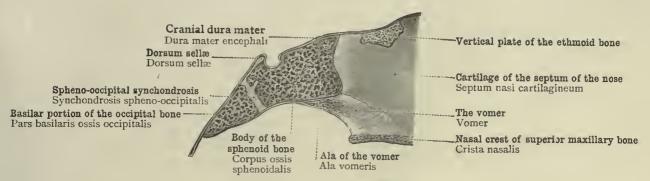


FIG. 381.—SYNCHONDROSIS. (THE SPHENO-OCCIPITAL SYNCHONDROSIS OF A GIRL AT THE AGE OF TWO YEARS; MEDIAN SAGITTAL SECTION.)

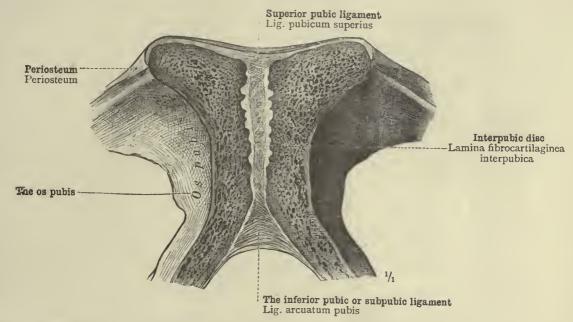


FIG. 382.—Symphysis. (The Pubic Symphysis; Frontal Section, Posterior Portion.)

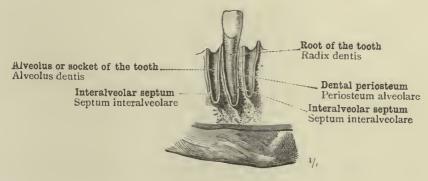


Fig. 383.—Gomphosis.

Synarthrosis, or Continuous Articulation.

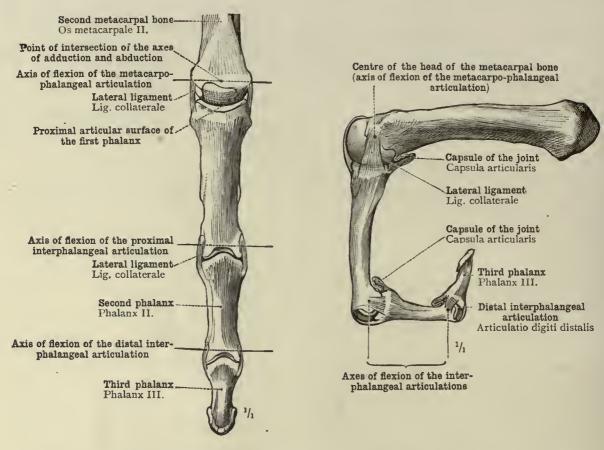


Fig. 384.—Extension. Posterior Aspect.

Fig. 385.—Flexion. Lateral Aspect.

DIARTHROSIS (METACARPO-PHALANGEAL ARTICULATION).—GINGLYMUS, OR HINGE JOINT (ARTICULATIONS OF THE FINGERS).

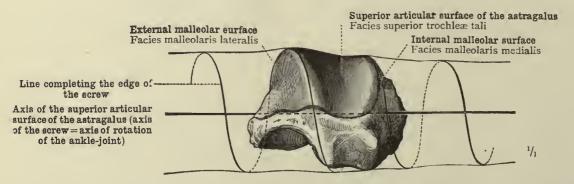


Fig. 386.—Articulatio Cochlearis, Cochleoid or Scre Ginglymus. (Superior Articular Surface of the Left Astragalus, seen from Behind, showing the Screw Form of the Ankle-Joint.

Diarthrosis, or Discontinuous Articulation—Articulatio simplex, simple joint.

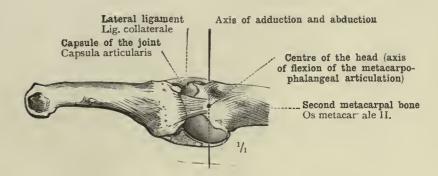


Fig. 387.—Condylarthrosis, or Condyloid Joint. (The Metacarpo-phalangeal Articulation of the Index-Finger; Lateral View.)

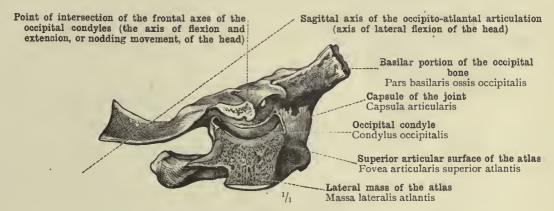


Fig. 388.—Condylarthrosis, or Condyloid Joint. (Right Occipito-atlantal Articulation; seen from the Outer Side.)

The outer half of the lateral mass of the atlas has been removed by a sagittal section passing through the joint.

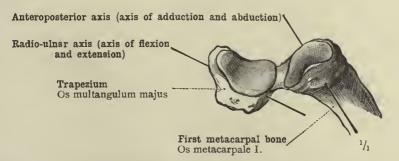


Fig. 389.—Articulatio Sellaris—Saddle Joint. (Articulatio Carpometacarpea Pollicis—Carpometacarpal Joint of the Thumb.)

Diarthrosis, or Discontinuous Articulation-Articulatio simplex, simple joint.

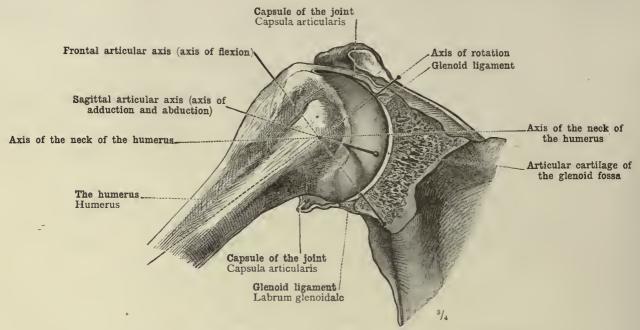


FIG. 390.—ENARTHROSIS, OR ARTHRODIA; BALL-AND-SOCKET JOINT. (THE RIGHT SHOULDER-JOINT SEEN FROM BEFORE, THE ANTERIOR HALF OF THE GLENOID FOSSA AND OF THE CAPSULE OF THE JOINT HAVING BEEN REMOVED.)

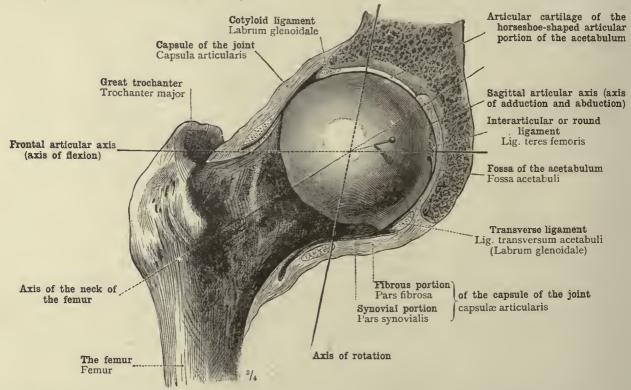


FIG. 391.—ENARTHROSIS, OR ARTHRODIA; BALL-AND-SOCKET JOINT. (THE RIGHT HIP-JOINT SEEN FROM BEFORE, THE ANTERIOR HALF OF THE ACETABULUM AND OF THE CAPSULE OF THE JOINT HAVING BEEN REMOVED.)

Diarthrosis, or Discontinuous Articulation—Articulatio simplex, simple joint; articulatio sphæroidea, ball-and-socket joint.

<sup>\*</sup> I have departed a little on this page from the author's terminology, which differs slightly from that in use in England. Both the hip and the shoulder joint are classed by him as examples of Articulation spherodea. Kngelgelenk—lit., "ball joint"; one of these, the shoulder-joint in which the concave articular surface is considerably less than a hemisphere in extent, is called by him Arthroom, freies Gelenk—lit., "free joint"; while the other, the hip-joint, in which the concave articular surface is considerably more than a hemisphere in extent, is called Enarthrosis, Nussgelenk—lit., "nut joint." English anatomists do not, as a rule, draw this distinction. The movements of the hip and the shoulder joint are identical in character, and the greater extent of the rigid portion of the enveloping surface in the one case than in the other has not been considered a difference sufficiently important to warrant a separation into two classes. Hence, in England the terms Enarthrosis and Arthrodia are applied indifferently to all ball-and-socket joints.—Tr.

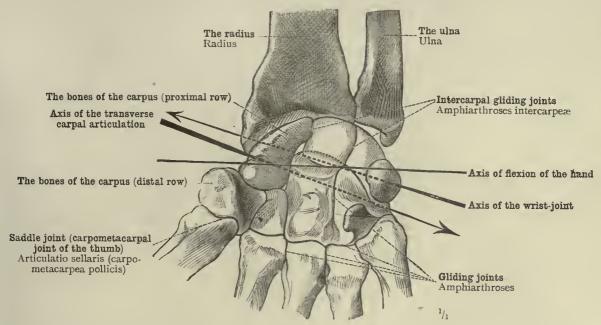


FIG. 392.—ARTICULATIO COMPOSITA, COMPOUND JOINTS (ARTICULATIONS OF THE HAND).—AMPHIARTHROSIS=ARTHRODIA OR GLIDING JOINT, AS SEEN IN THE INTERCARPAL, CARPOMETACARPAL, AND INTERMETACARPAL JOINT.

The arrows show the dorsal emergence of the axes of the wrist joint and of the transverse carpal articulation respectively.

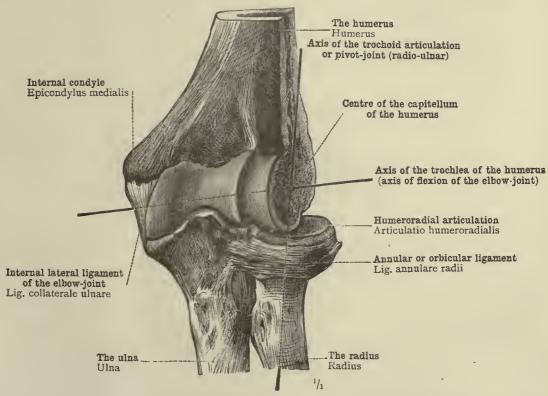


FIG. 393.—ARTICULATIO TROCHOIDEA, TROCHOID OR PIVOT JOINT.—GINGLYMUS, HINGE JOINT.

(PALMAR ASPECT OF THE ELBOW-JOINT.)

The radial half of the capitellum of the humerus has been removed by a sagittal section passing through its centre of curvature.

Diarthrosis, or Discontinuous Articulation.

Amphiarthrosis, arthrodia or gliding joint—Articulatio composita, compound joint.

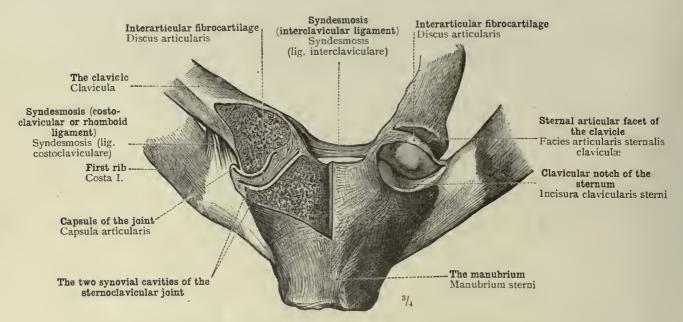


Fig. 394.—Syndesmosis.—Interarticular Fibrocartilage. (The Sternoclavicular Articulation, Anterior Aspect.)

The right articulation is divided through the middle by a frontal section; in the left, are front portion of the capsule has been removed, and the clavicle has been drawn backwards.

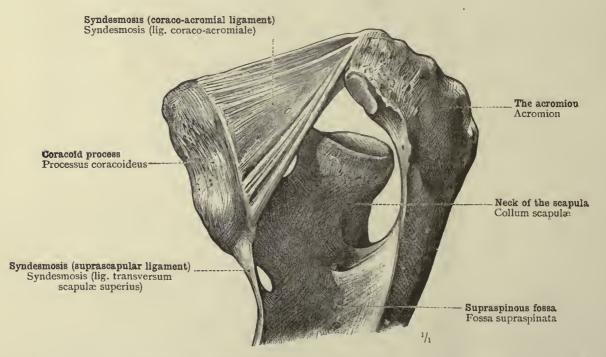


Fig. 395.—Syndesmoses Scapulæ, Proper Ligaments of the Scapula; seen from Above.

Syndesmosis, fibrous or gamentous union—Discus articularis, interarticular fibrocartilage.

## JUNCTURÆ OSSIUM TRUNCI THE ARTICULATIONS OF THE TRUNK

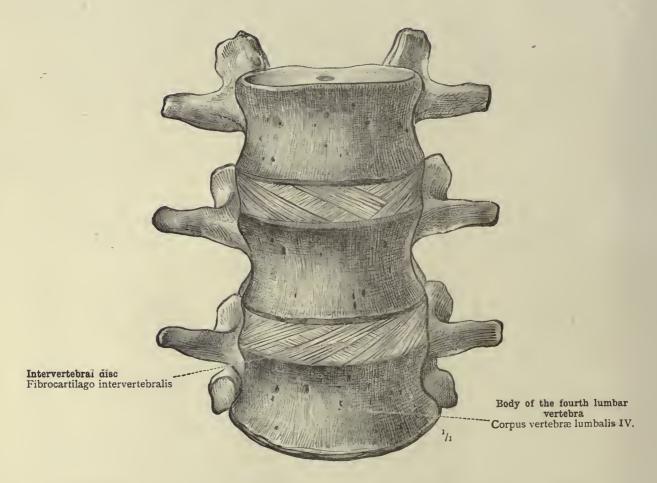


Fig. 396.—Fibrocartilagines Intervertebrales, Intervertebral Discs. (Second, Third, and Fourth Lumbar Vertebræ; seen from Before.)

Ligamenta columnæ vertebralis-The ligaments of the vertebral column.

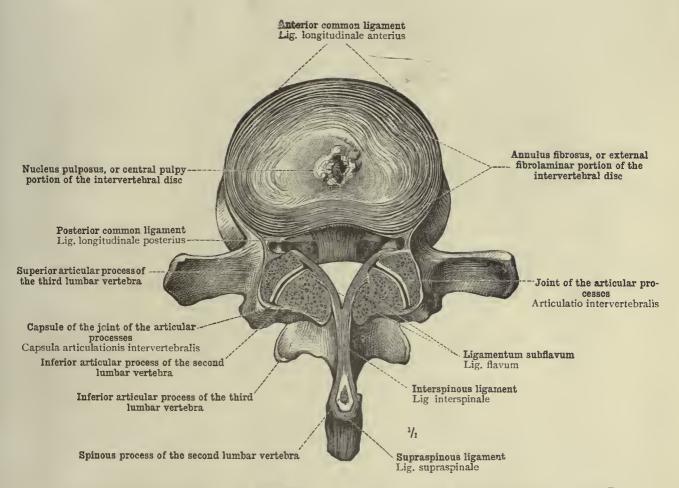


Fig. 397.—Intervertebral Disc between the Second Lumbar Vertebra and the Third. (Lower Half of a Horizontal Section.)

columnæ vertebralis-The ligaments of the vertebral column.

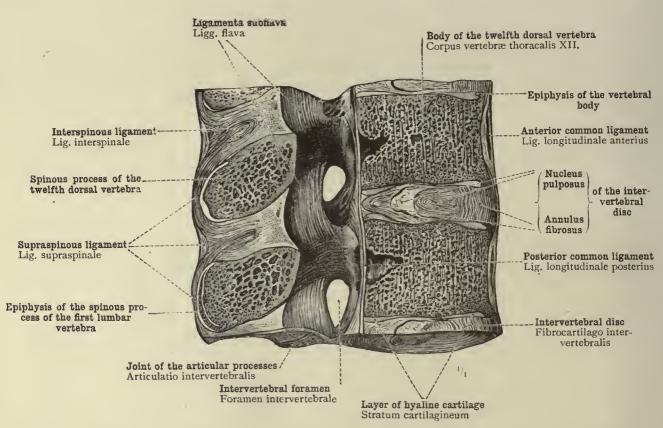


Fig. 398.—Fibrocartilagines Intervertebrales, Intervertebral Discs. Ligamenta Flava, or Subflava. Ligamenta Interspinalia, Interspinous Ligaments. Ligamentum Supraspinale, Supraspinous Ligament. (Median Section through the Twelfth Dorsal and the First Lumbar Vertebræ, Left Half.)

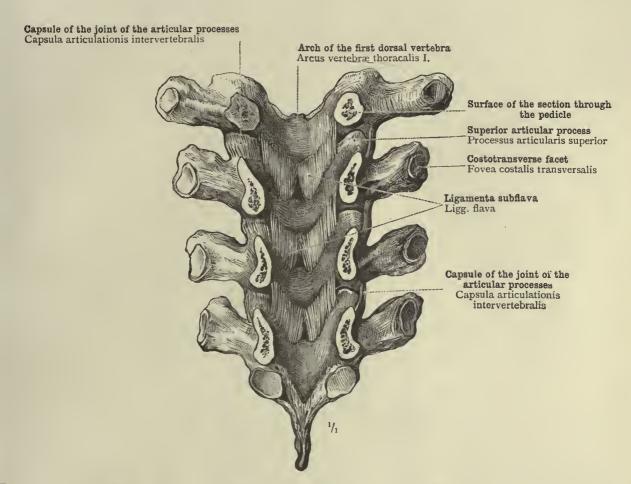
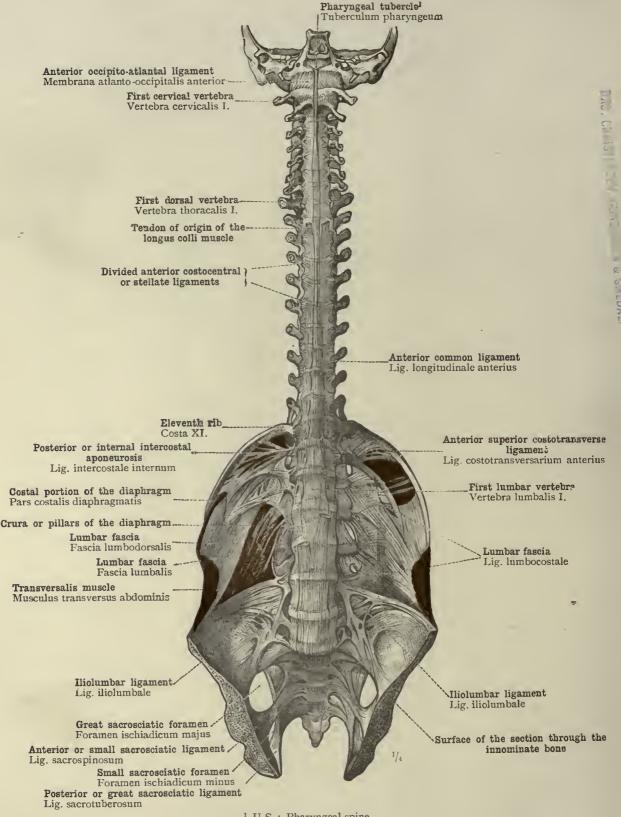


Fig. 399.—Ligamenta Flava, Ligamenta Subflava. Articulationes Intervertebrales, Intervertebral Articulations. Of these Latter the Right are unopened, the Left opened. (The Arches of the First Four Dorsal Vertebræ, separated from the Bodies by a Frontal Section. Seen from Before.)



<sup>1</sup> U.S.: Pharyngeal spine.

Fig. 400.—Ligamentum Longitudinale Anterius, the Anterior Common Ligament. Ligamentum Lumbocostale, Lumbocostal Ligament. (The Ventral Aspect of the Vertebral Column, the Anterior Half of the Base of the Skull and the Anterior Half of the Pelvis Having been removed.)

Ligamenta columnæ vertebralis-The ligaments of the vertebral column.

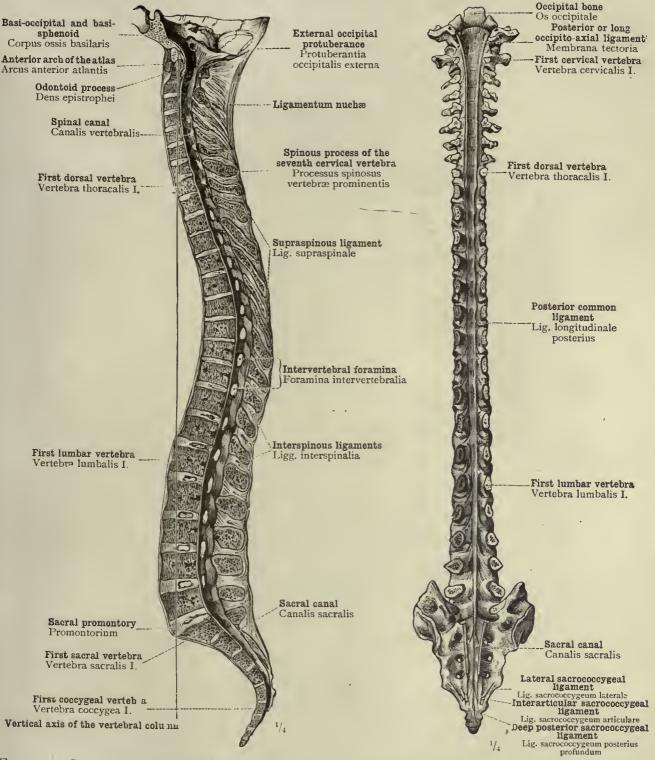


Fig. 401.—Intervertebral Discs, Interspinous Ligaments, Supraspinous Ligament, Ligamentum Nuchæ. Spinal Canal; Intervertebral Foramina. Vertical Axis of the Vertebral Column. (Median Section through the Vertebral Column.)

FIG. 402.—POSTERIOR COMMON LIGAMENT AND ITS RELATION WITH THE POSTERIOR OCCIPITO-AXIAL AND THE DEEP POSTERIOR SACRO-COCCYGEAL LIGAMENTS. (THE VERTEBRAL COLUMN WITH THE SPINAL CANAL OPENED BY THE REMOVAL OF THE NEURAL ARCHES; SEEN FROM BEHIND.)

<sup>&</sup>lt;sup>1</sup> Macalister calls this ligament ligamentum latum axiale, the broad axial ligament.—Tr.

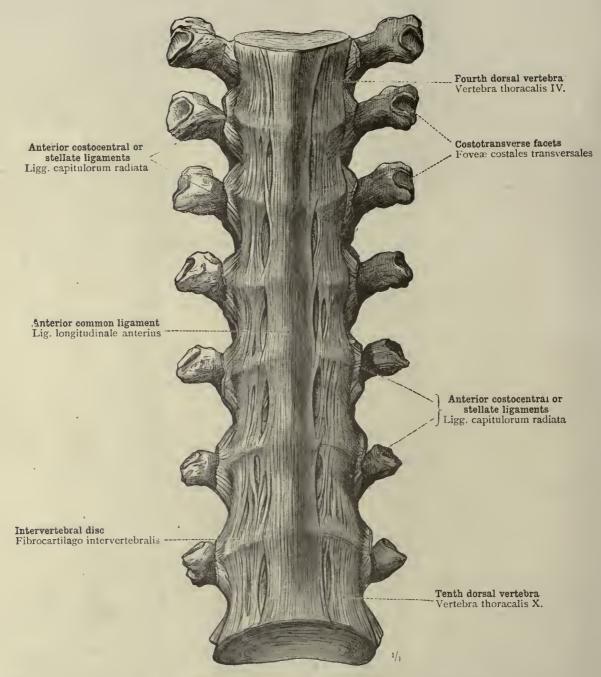


Fig. 403.—Ligamentum Longitudinale Anterius, the Anterior Common Ligament of the Vertebral Column. (The Fourth to the Tenth Dorsal Vertebræ; seen from Before.)

Ligamenta columnæ vertebralis-The ligaments of the vertebral column.

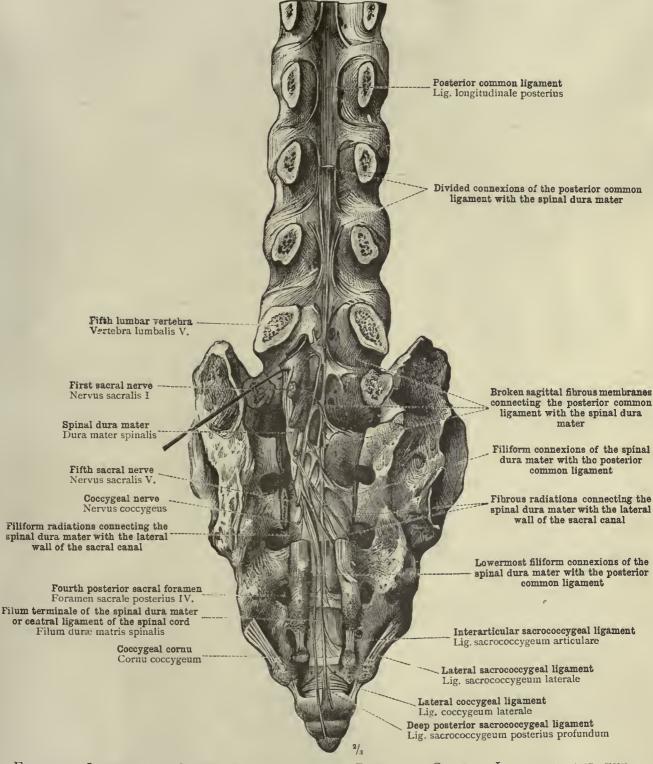


Fig. 404.—Lumbar and Sacral Portions of the Posterior Common Ligament, and the Connexions of this Ligament with the Spinal Dura Mater and with the Deep Posterior Sacrococcygeal Ligament. (The Sacrum and the Lumbar Portion of the Vertebral Column with the Spinal Canal Laid open from Behind.)

The sacral portion of the dura mater has been drawn to the left side.

Ligamenta columnæ vertebralis—The ligaments of the vertebral column.

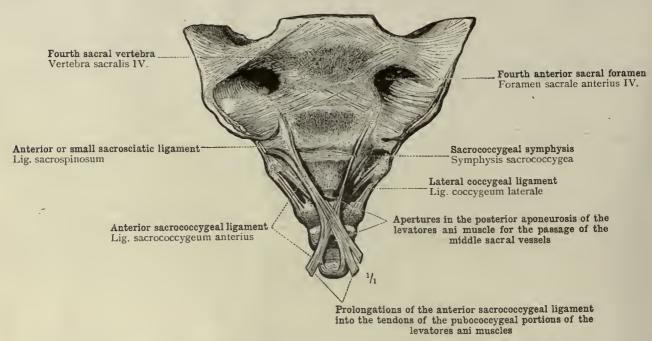


Fig. 405.—The Ligaments connecting the Anterior Surfaces of the Sacrum and Coccyx: the Anterior and the Lateral Sacrococcygeal Ligaments.

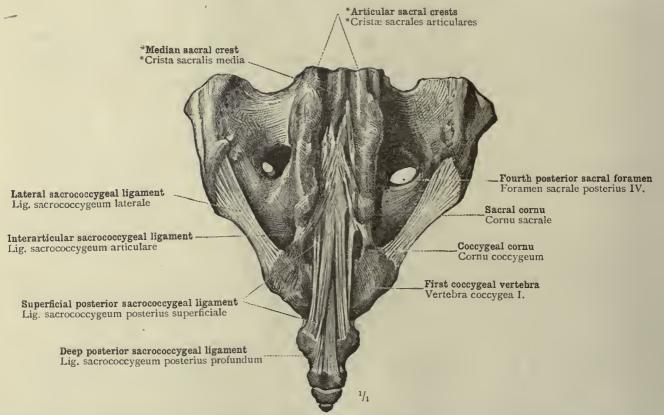


Fig. 406.—The Ligaments connecting the Posterior Surfaces of the Sacrum and Coccyx: the Superficial and Deep Posterior Sacrococcygeal Ligaments, and the Interarticular and Lateral Sacrococcygeal Ligaments.

THE COCCYX WITH THE TWO LAST SACRAL VERTEBRÆ.

Ligamenta columnæ vertebralis-The ligaments of the vertebral column.

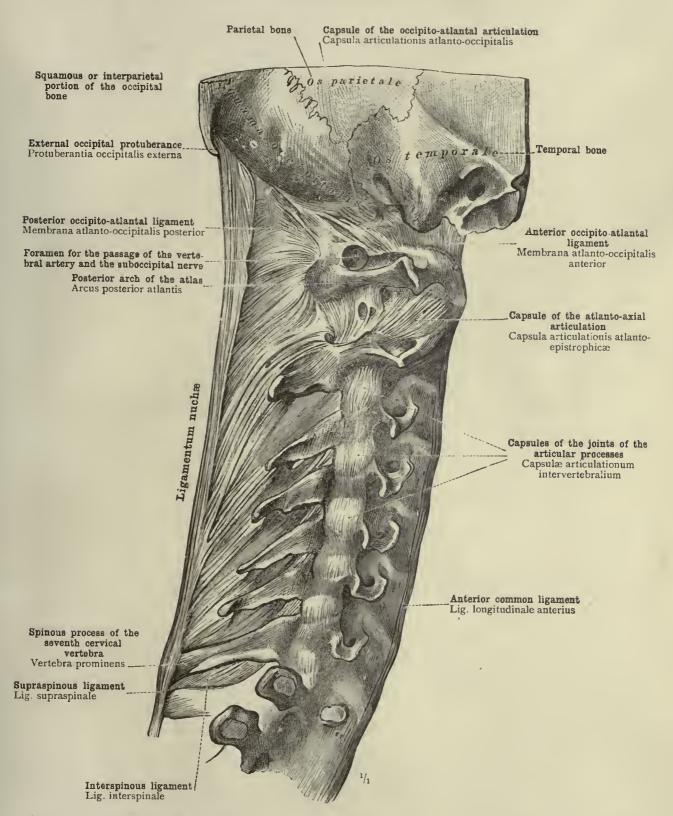


FIG. 407.—LIGAMENTUM NUCHÆ. (THE CERVICAL PORTION OF THE VERTEBRAL COLUMN AND THE POSTERIOR PORTION OF THE CRANIUM; SEEN FROM THE RIGHT SIDE.)

Ligamenta columnæ vertebralis-The ligaments of the vertebral column.

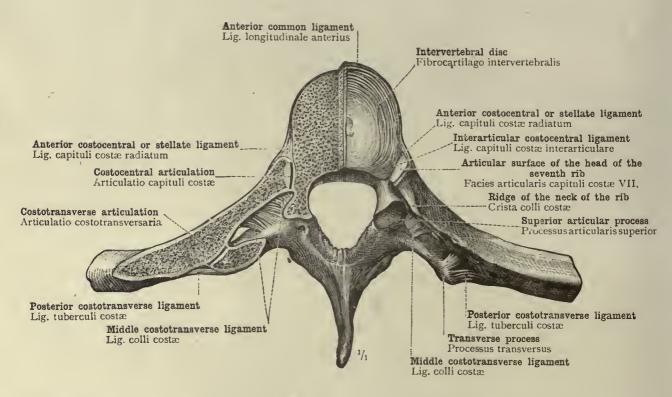
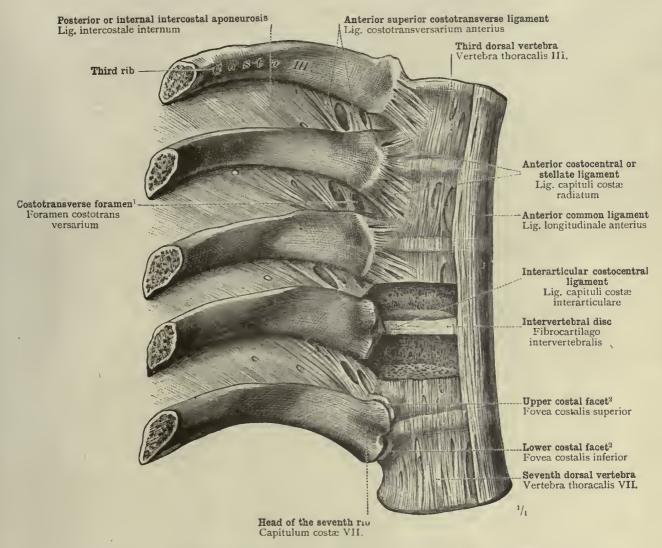


Fig. 408.—Articulationes Capitulorum et Costotransversariæ, the Costocentral and Costotransverse Articulations: Ligamentum Capituli Costæ Interarticulare, the Interarticular Costocentral Ligament; Ligamentum Colli Costæ et Ligamentum Tuberculi Costæ, the Middle and Posterior Costotransverse Ligaments. (The Seventh Dorsal Vertebra with the Vertebral Extremities of the Seventh Pair of Ribs; seen from Above.)

On the left side the costocentral and costotransverse articulations have been opened by a horizontal section through the rib and the vertebral body; on the right side the section passes through the intervertebral disc on a plane just above the attachment of the interarticular costocentral ligament to the ridge between the two articular facets on the vertebral extremity of the rib.



<sup>1</sup> This term, costotransverse foramen, is also used by English anatomists to denote the foramina in the transverse processes of the cervical vertebræ for the transmission of the vertebral artery.—Tr.

<sup>2</sup> These are upper and lower costal facets respectively in relation to the articular surface of the bead of the rib; but, strictly speaking, what is here called "upper costal facet" is the lower costal facet of the sixth dorsal vertebra; while what is here called "lower costal facet" is the upper costal facet of the seventh dorsal vertebra.—Tr.

Fig. 409.—Costocentral and Costotransverse Articulations: Anterior Costocentral or Stellate Ligament; Interarticular Costocentral Ligament; Anterior Superior Costotransverse Ligament; and Costotransverse Foramina. Posterior or Internal Intercostal Aponeuroses. (The Third to the Seventh Dorsal Vertebræ with the Vertebral Extremities of the Third to the Seventh Right Ribs; seen from the Right and from Before.)

The third, fourth, and fifth costocentral articulations are unopened; the sixth and the seventh have been opened from before. In the sixth articulation, by the partial removal of the bodies of the fifth and sixth dorsal vertebræ, the upper and lower surfaces of the intervertebral disc have been exposed, and the attachment of the disc to the ridge between the two articular facets on the head of the rib has been demonstrated.

Articulationes costovertebrales—Costovertebral articulations.

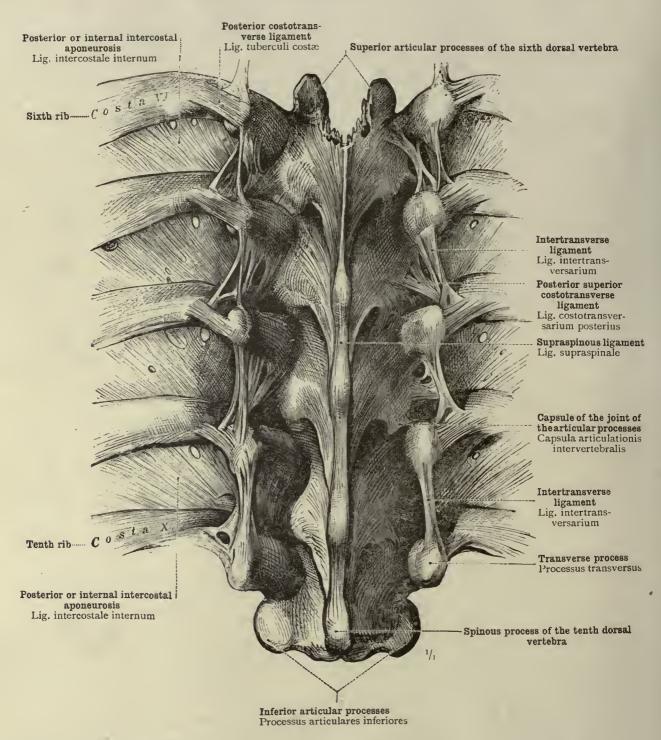


Fig. 410.—The Ligaments connecting the Dorsal Vertebræ with the Ribs posteriorly: Posterior and Posterior Superior Costotransverse Ligaments; Intertransverse Ligaments; Posterior or Internal Intercostal Aponeuroses; Supraspinous Ligament. (Sixth to Tenth Dorsal Vertebræ with the Vertebral Extremities of the Sixth to Tenth Ribs.)

Articulationes costovertebrales—Costovertebral articulations.

Third dorsal vertebra

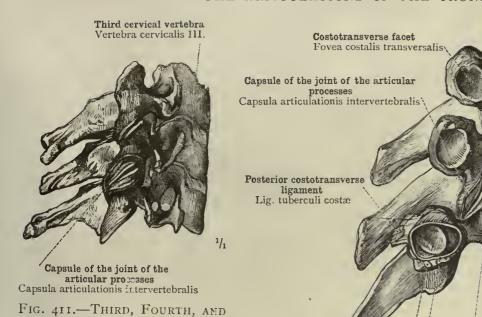
Interarticular costocentral ligament

Lig. capituli costæ interarticulare

Capsula articulationis capituli
Capsule of the costotransverse articulation

Capsule of the costocentral articulation

Vertebra thoracalis III.

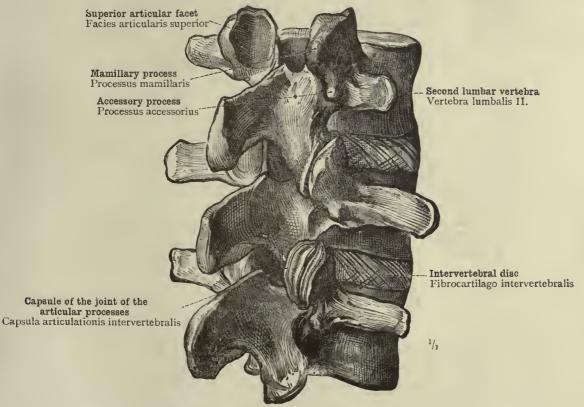


FIFTH CERVICAL VERTEBRÆ

SEEN FROM THE RIGHT STOE.

Fig. 412.—Third, Fourth, and Fifth Dorsal Vertebræ seen from the Right Side.

Capsula articulationis costotransversariæ



Anterior superior costetransverse ligament Lig. costetransversarium anterius

Fig. 413.—Second, Third, and Fourth Lumbar Vertebræ seen from the Right and from Behind.

THE DIRECTION OF THE ARTICULAR SURFACES AND THE CONNEXIONS OF THE CAPSULES OF THE JOINTS OF THE ARTICULAR PROCESSES IN THE CERVICAL, DORSAL, AND LUMBAR VERTEBRÆ RESPECTIVELY.

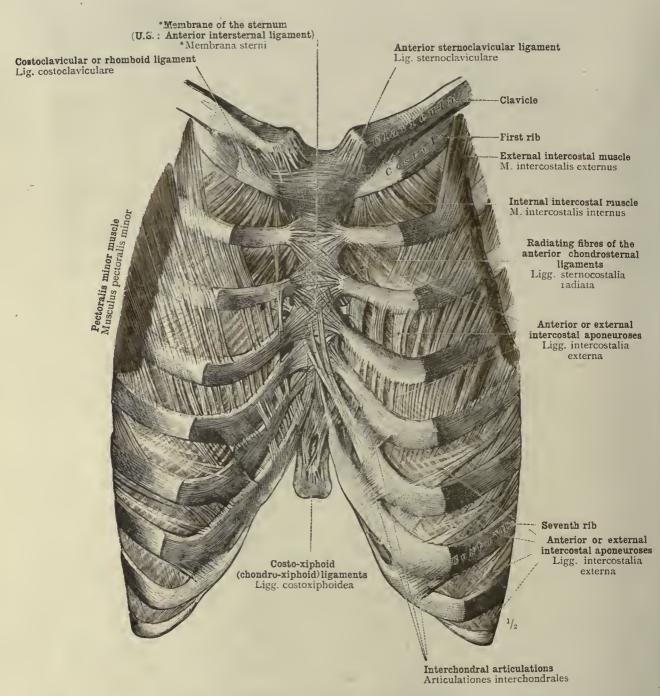


FIG. 414.—\*MEMBRANE OF THE STERNUM. ANTERIOR CHONDROSTERNAL LIGAMENTS, COSTO-XIPHOID LIGAMENTS, AND ANTERIOR OR EXTERNAL INTERCOSTAL APONEUROSES. THE RELATION OF THESE LATTER TO THE EXTERNAL INTERCOSTAL MUSCLES AND TO THE PECTORALIS MINOR MUSCLE. (ANTERIOR WALL OF THE THORAX SEEN FROM BEFORE.)

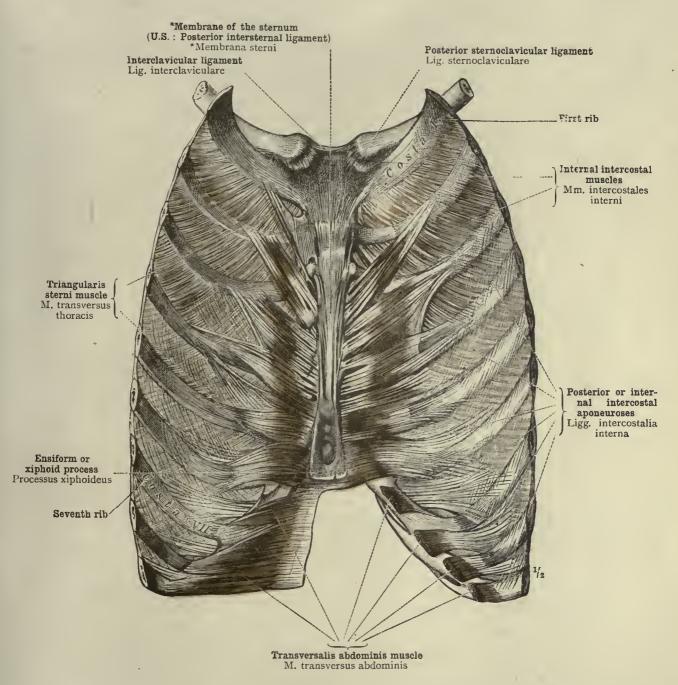


FIG. 415.—POSTERIOR OR INTERNAL INTERCOSTAL APONEUROSES, AND THEIR RELATION TO THE TRIANGULARIS STERNI AND TRANSVERSALIS ABDOMINIS MUSCLES. STERNOCLAVICULAR ARTICULATION. (ANTERIOR WALL OF THE THORAX SEEN FROM BEHIND.)

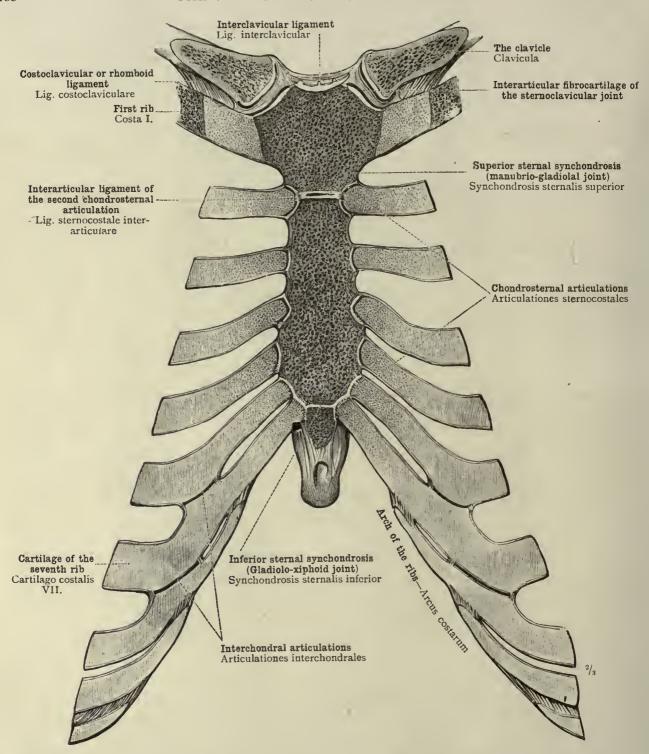


Fig. 416.—Chondrosternal Articulations. Interchondral Articulations. Interstirnal Synchondroses. Sternoclavicular Articulation. (Posterior Half of a Frontal Section through the Sternum, the Cartilages of the Ribs, and the Sternal Extremities of the Clavicles.)

'Articulationes sternocostales—Chondrosternal articulations.

## ARTICULATIONES ET LIGAMENTA CAPITIS

THE ARTICULATIONS
AND LIGAMENTS OF THE HEAD

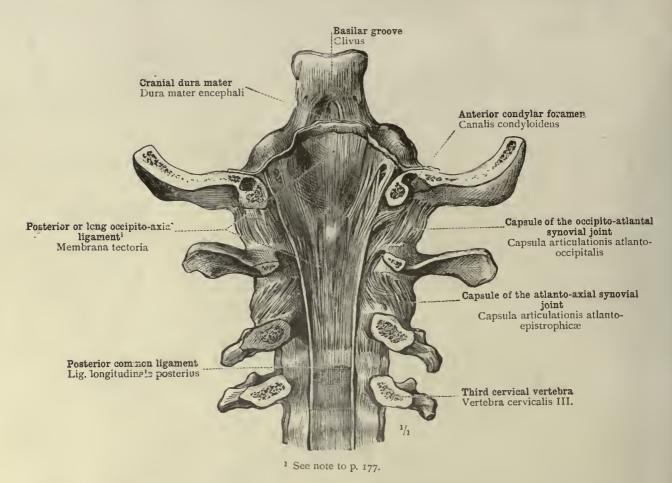


FIG. 417.—POSTERIOR OCCIPITO-AXIAL LIGAMENT. OCCIPITO-ATLANTAL AND ATLANTO-AXIAL SYNOVIAL JOINTS. (THE THREE UPPERMOST CERVICAL VERTEBRÆ AND THE OCCIPITAL BONE SEEN FROM BEHIND.)

By a frontal section behind the occipital condyles, the squamous portion of the occipital bone and the neural arches have been removed. The dura mater has been cut transversely in the basilar groove, and turned upwards

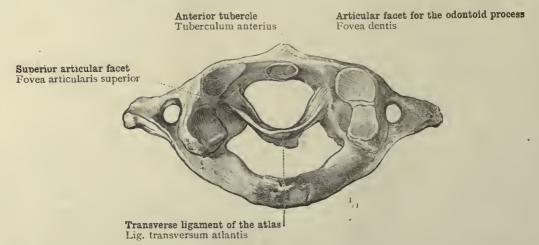


FIG. 418.—TRANSVERSE LIGAMENT OF THE ATLAS. (THE ATLAS SEEN FROM ABOVE.)

Articulationes atlanto-occipitalis et atlanto-epistrophica—Occipito-atlantal and atlanto-axial articulations.

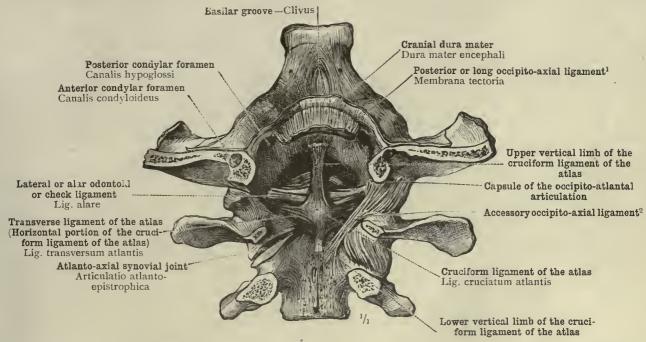


Fig. 419.—Cruciform Ligament of the Atlas; Lateral or Alar Odontoid or Check Ligaments Occipito-atlantal and Atlanto-axial Synovial Joints, the Right closed, the Left open.

The cranial dura mater and the posterior or long occipito-axial ligament<sup>1</sup> have been cut transversely in the basilar groove and turned upwards.

<sup>2</sup> Accessory occipito-axial ligament. This ligament is not mentioned by the author, though it is well shown in Fig. 419. The accessory ligament is a bundle of fibres strengthening the capsule of the occipito-atlantal joint at its postero-internal angle. It runs downwards and inwards from the back of the occipital condyle to the body of the axis near the base of the odontoid process.—Tr.

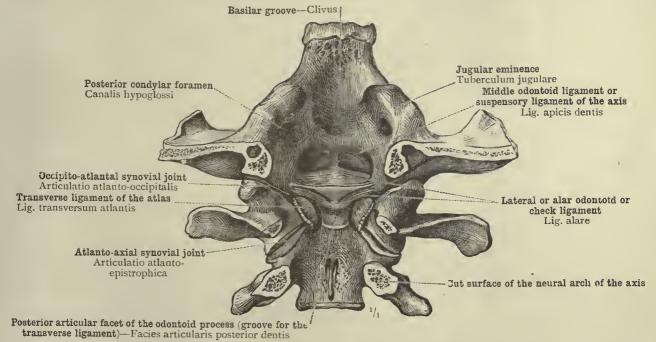
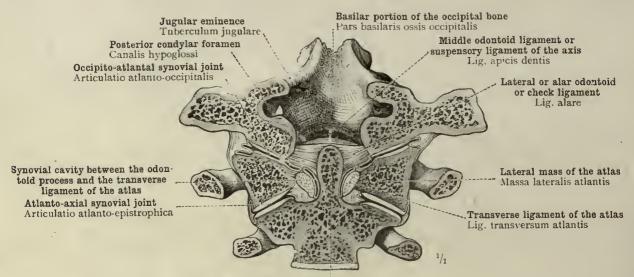


Fig. 420.—Lateral or Alar Odontoid or Check Ligaments. Middle Odontoid Ligament or Suspensory Ligament of the Axis.

The transverse ligament of the atlas has been divided in the middle and the parts have been turned outwards; the dura mater and the posterior or long occipito-axial ligament have been entirely removed.

THE ATLAS AND THE AXIS WITH THE ANTERIOR PORTION OF THE OCCIPITAL BONE SEEN FROM BEHIND, A SECTION HAVING BEEN MADE SIMILAR TO THAT IN THE PREPARATION SHOWN IN FIG. 414.

Articulationes atlanto-occipitalis et atlanto-epistrophica—Occipito-atlantal and atlanto-axial articulations.



Odontoid process-Dens epistrophei

FIG. 421.—OCCIPITO-ATLANTAL AND ATLANTO-AXIAL ARTICULATIONS IN FRONTAL SECTION.

LATERAL OR ALAR ODONTOID OR CHECK LIGAMENTS AND MIDDLE ODONTOID LIGAMENT OR

SUSPENSORY LIGAMENT OF THE AXIS.

The section passes through the middle of the posterior condylar foramina; and divides the summit of the antero-posterior curve of the occipital condyles.

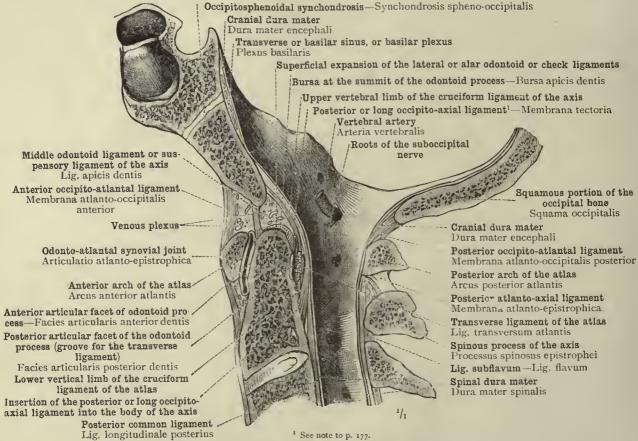


FIG. 422.—ARTICULATIONS AND LIGAMENTS OF THE ODONTOID PROCESS. STRATIFORM ARRANGE-MENT OF THE CRUCIFORM LIGAMENT OF THE ATLAS, THE POSTERIOR OR LONG OCCIPITO-AXIAL LIGAMENT, AND THE DURA MATER. SPHENO-OCCIPITAL SYNCHONDROSIS. (MEDIAN SECTION THROUGH THE POSTERIOR PORTION OF THE BASE OF THE CRANIUM AND THE THREE UPPERMOST CERVICAL VERTEBRÆ.)

Articulationes atlanto-occipitalis et atlanto-epistrophica—Occipito-atlantal and atlanto-axial articulations.

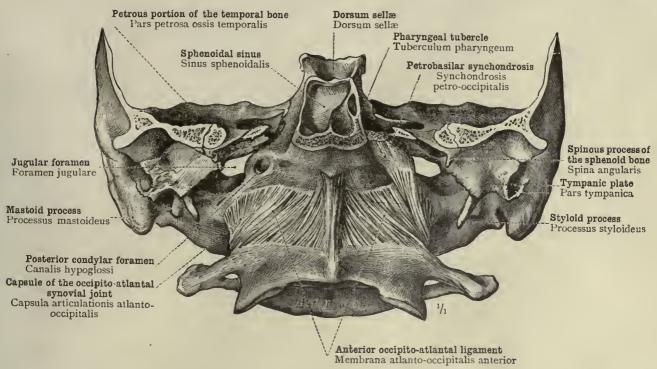


FIG. 423.—Antep or Occipito-atlantal Ligament and Petrobasilar Synchondrosis. (The Atlas with the Posterior Portion of the Base of the Skull, seen from Before.)

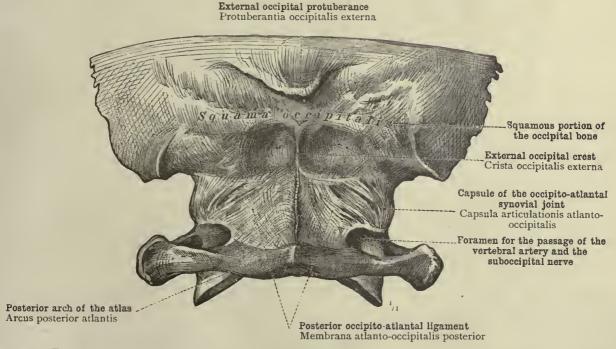


Fig. 424.—Posterior Occipito-atlantal Ligament. (The Atlas with the Occipital Bone, seen from Behind.)

Articulatio atlanto-occipitalis-Occipito-atlantal articulation.

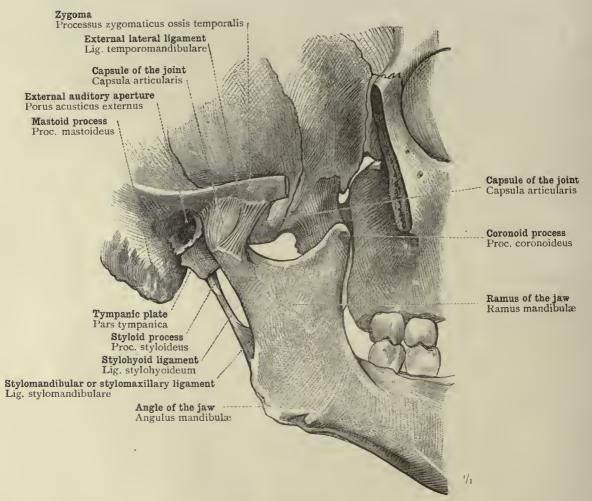


Fig. 425.—Articulatio Mandibularis, Temporomandibular or Temporomaxillary Articulation: Ligamenta Temporomandibulare et Stylomandibulare, External Lateral and Stylomandibular or Stylomaxillary Ligaments. Ligamentum Stylohyoideum, Stylohyoid Ligament. (Right Temporomandibular or Temporomaxillary Articulation, seen from the Outer Side.)

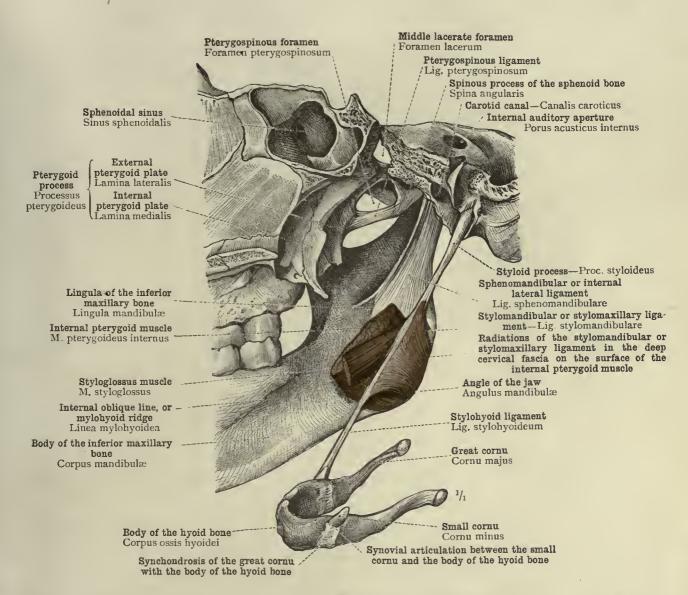


Fig. 426.—Articulatio Mandibularis, Temporomandibular or Temporomaxillary Articulation: Ligamenta Sphenomandibulare et Stylomandibulare, Sphenomandibular or Internal Lateral and Stylomandibular or Stylomaxillary Ligament. Relations of the Stylomandibular or Stylomaxillary Ligament to Styloglossus and Internal Pterygoid Muscles. Ligamentum Pterygospinosum, Pterygospinous Ligament. (The Posterior Part of the Facial Portion of the Skull with the Adjoining Portion of the Base of the Skull, divided sagitally somewhat to the Left of the Median Plane.)

The basilar and condylar portions of the occipital bone have been removed.

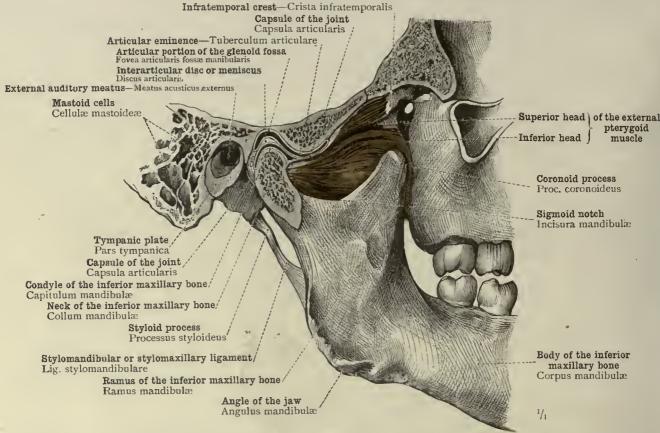


Fig. 427.—Articulatio Mandibularis, Temporomandibular or Temporomaxillary Articulation: Discus Articularis. Interarticular Disc or Meniscus, and Ligamentum Stylomandibulare, Stylomandibular or Stylomaxillary Ligament. Relations of the Superior Head of the External Pterygoid Muscle to the Anterior Wall of the Capsular Ligament and to the Interarticular Disc or Meniscus. (Right Temporomandibular or Temporomaxillary Articulation, divided in a Plane nearly approaching the Sagittal; the Internal Portion Being Figured.)

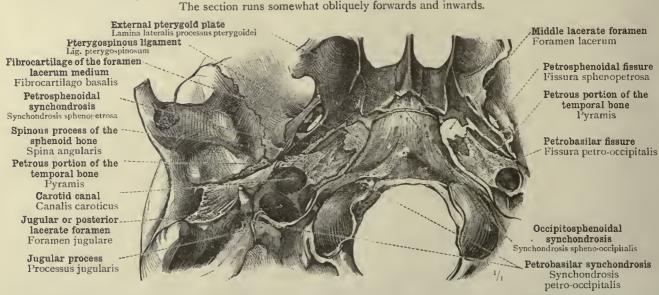


Fig. 428.—Fibrocartilago Basalis; Fibrocartilage of the Foramen Lacerum Medium: Synchondroses Sphenopetrosa, Petro-occipitalis, et Spheno-occipitalis; Petrosphenoidal, Petrobasilar, and Occipitosphenoidal Synchondroses: Ligamentum Pterygospinosum; Pterygospinous Ligament. (The Middle Portion of the Base of the Skull, seen from Below.)

Articulatio mandibularis, temporomandibular or temporomaxillary articulation—Synchondroses et ligamenta baseos cranii, synchondroses and ligaments of the base of the skull.

## JUNCTURÆ OSSIUM EXTREMITATUM, SUPERIORIS ET INFERIORIS

THE ARTICULATIONS

OF THE SUPERIOR AND INFERIOR

EXTREMITIES

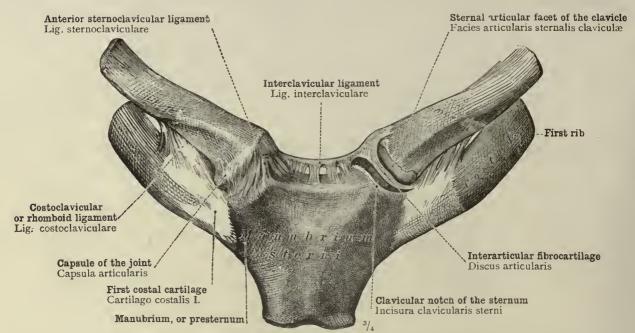
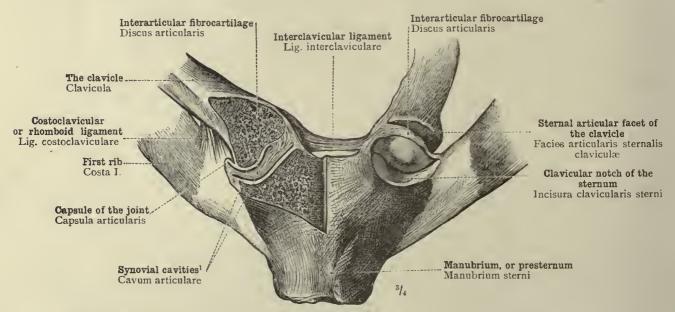


Fig. 429.—Articulatio Sternoclavicularis, Sternoclavicular Articulation: Capsula Articularis, Capsule of the Joint; Discus Articularis, Interarticular Fibrocartilage; Ligamenta Interclaviculare et Costoclaviculare, Interclavicular and Costoclavicular or Rhomboid Ligaments.

The left sternoclavicular articulation has been opened by the removal of the anterior wall of the capsular ligament.



<sup>1</sup> The interarticular fibrocartilage is occasionally defective in the centre, and in rare cases even entirely wanting; there is then only one synovial cavity.—Tr.

Fig. 430.—Articulatio Sternoclavicularis, Sternoclavicular Articulation: Discus et Capsula Articularis, Interarticular Fibrocartilage and Capsular Ligament; Cavum Articulare, Synovial Cavity or Cavities; Ligamenta Interclaviculare et Costoclaviculare, Interclavicular and Costoclavicular or Rhomboid Ligaments.

The right sternoclavicular articulation has been divided by a frontal section; in the left, the capsule has been removed and the clavicle has been drawn backwards.

STERNOCLAVICULAR ARTICULATION, SEEN FROM BEFORE.

Articulationes et ligamenta cinguli extremitatis superioris—Articulations and ligaments of the shoulder-girdle,

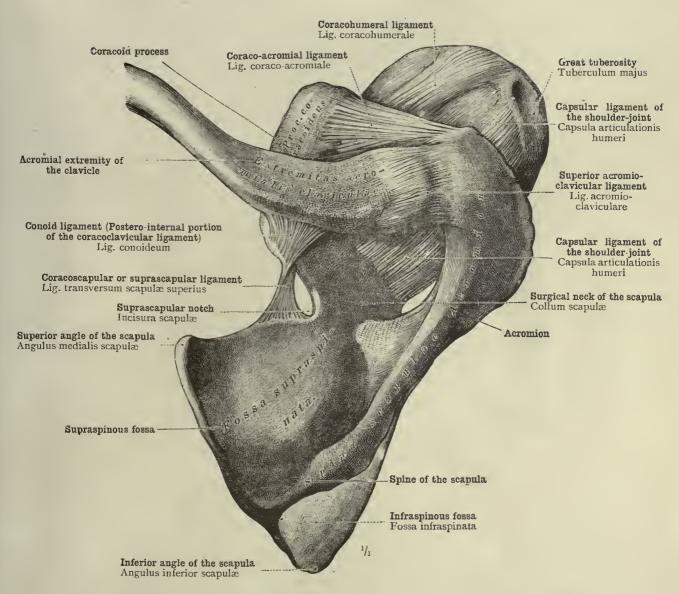
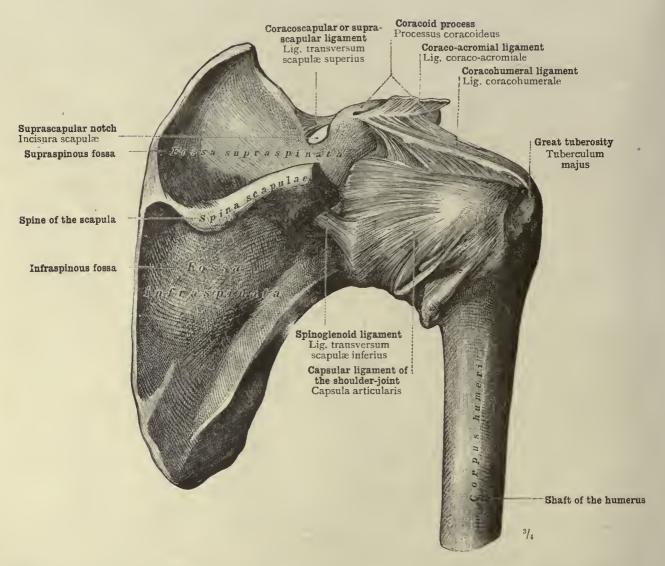


Fig. 431.—Ligamenta Acromioclaviculare et Coracoclaviculare, Superior Acromioclavicular Ligament and Coracoclavicular Ligament (Conoid Portion); Ligamenta Coraco-acromiale et Transversum Scapulæ Superius, Coraco-acromial and Suprascapular Ligaments. (The Right Scapula with the Acromial Half of the Clavicle and the Shoulder-Joint, seen from Above.)

Articulationes et ligamenta cinguli extremitatis superioris—Articulations and ligaments of the shoulder-girdle.



717. 432.—ARTICULATIO HUMERI, SHOULDER-JOINT: CAPSULA ARTICULARIS, CAPSULAR LIGAMENT; LIGAMENTUM CORACOHUMERALE, CORACOHUMERAL LIGAMENT; LIGAMENTUM TRANSVERSUM SCAPULÆ SUPERIUS ET LIGAMENTUM TRANSVERSUM SCAPULÆ INFERIUS, CORACOSCAPULAR OR SUPRASCAPULAR LIGAMENT AND SPINOGLENOID LIGAMENT. (THE RIGHT SHOULDER-JOINT, SEEN FROM BEHIND.)

The acromion has been sawn off, and the coracoid extremity of the coraco-acromial ligament has been turned upwards.

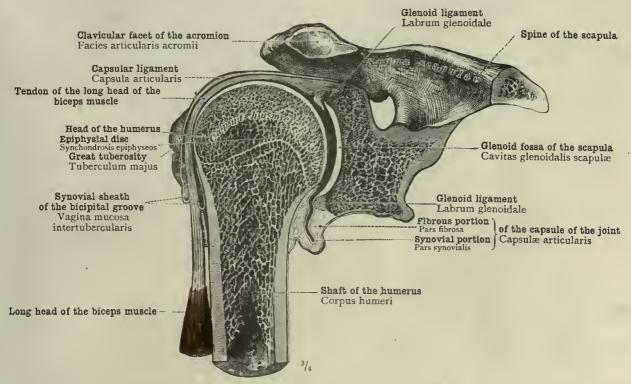


FIG. 433.—ARTICULATIO HUMERI, SHOULDER-JOINT: LABRUM GLENOIDALE, GLENOID LIGAMENT; RELATIONS OF THE TENDON OF THE LONG HEAD OF THE BICEPS MUSCLE AND OF THE EPIPHYSIAL DISC TO THE SYNOVIAL CAVITY OF THE ARTICULATION. (THE RIGHT SHOULDER-JOINT IN FRONTAL SECTION; POSTERIOR HALF.)

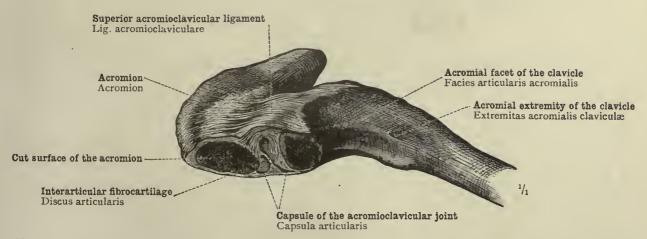


Fig. 434.—Articulatio Acromioclavicularis, Acromioclavicular Joint: Discus Articularis, Interarticular Fibrocartilage; Ligamentum Acromioclaviculare, Superior Acromioclavicular Ligament. (The Right Acromioclavicular Articulation in Frontal Section; Posterior Portion.)

Articulatio humeri—Shoulder-joint. Articulatio acromioclavicularis—Acromioclavicular articulation.

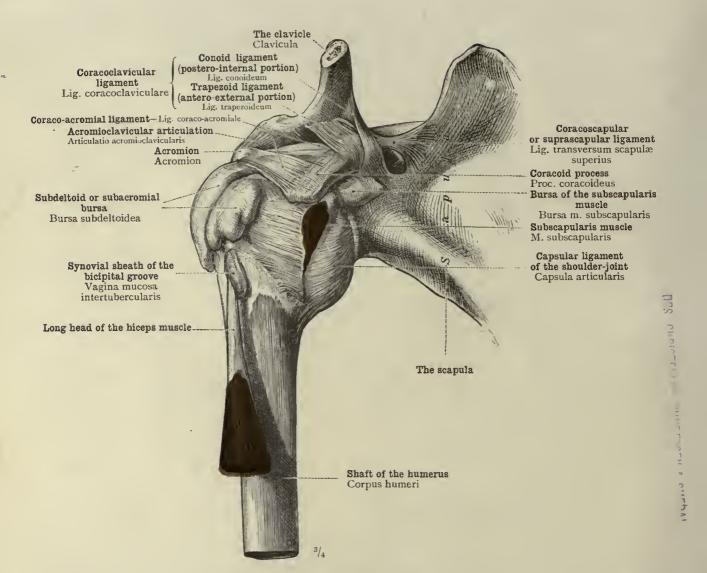


FIG. 435.—ARTICULATIONES HUMERI ET ACROMIOCLAVICULARIS, THE SHOULDER-JOINT AND THE STERNOCLAVICULAR ARTICULATION: BURSA MUSCULI SUBSCAPULARIS ET BURSA SUBDELTOIDEA, BURSA OF THE SUBSCAPULARIS MUSCLE AND SUBDELTOID OR SUBACROMIAL BURSA; VAGINA MUSCOSA INTERTUBERCULARIS, SYNOVIAL SHEATH OF THE BICIPITAL GROOVE; LIGAMENTA CORACOCLAVICULARE, CORACO-ACROMIALE, ET TRANSVERSUM SCAPULÆ SUPERIUS; THE CORACOCLAVICULAR (CONOID AND TRAPEZOID), CORACO-ACROMIAL, AND CORACOSCAPULAR OR SUPRASCAPULAR LIGAMENT. (RIGHT SHOULDER-JOINT, INJECTED WITH TALLOW; THE ACROMIAL EXTREMITY OF THE CLAVICLE HAS BEEN DRAWN UPWARDS. SEEN FROM BEFORE.)

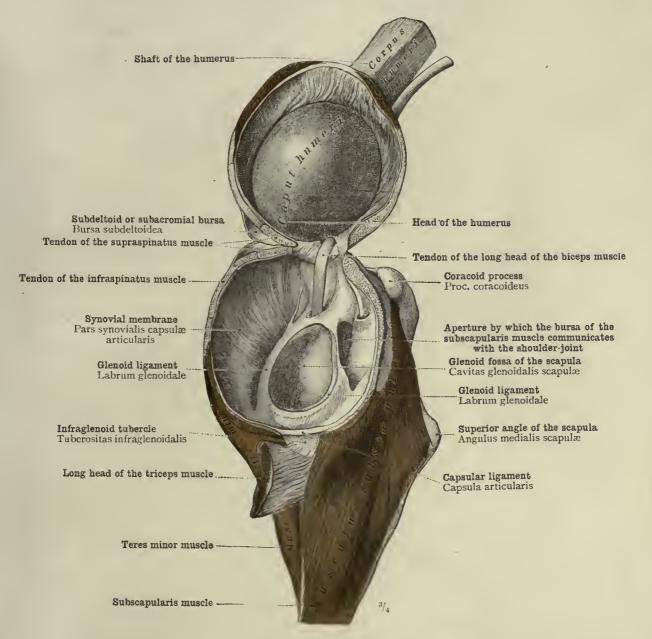


Fig. 436.—Articulatio Humeri, Shoulder-Joint: Intracapsular Portion of the Tendon of the Long Head of the Biceps Muscle; Labrum Glenoidale, Glenoid Ligament; Aperture of Communication of the Bursa of the Subscapularis Muscle with the Shoulder-Joint; Relations of the Tendons of the Scapular Muscles with the Capsule of the Shoulder-Joint. (Right Shoulder-Joint from the Outer Side)

After tallow had been injected into the joint and allowed to harden, the capsular ligament and the surrounding scapular muscles were divided by a circular incision midway between their attachments to the scapula and the humerus, a strip of the capsule, however, being left undivided, where the tendon of the long head of the biceps muscle passes through the joint. The humerus with the distal half of the capsule has been turned upwards.



<sup>1</sup> Projection of the synovial membrane of the elbow-joint, which membrane, after passing downwards between the vertical articular surface of the head of the radius and the inner surface of the orbicular ligament, forms a circular pouch or sac below this ligament around the neck of the radius.—Tr.

FIG. 437.—ARTICULATIO CUBITI, ELBOW-JOINT: CAPSULA ARTICULARIS, CAPSULE OF THE JOINT; LIGAMENTA COLLATERALIA, LATERAL LIGAMENTS; LIGAMENTUM ANNULARE RADII, ANNULAR OR ORBICULAR LIGAMENT OF THE RADIUS; \*RECESSUS SACCIFORMIS (see note, above). (RIGHT ELBOW-JOINT, UNOPENED; ANTERIOR OR PALMAR ASPECT.)

The \*recessus sacciformis has been injected with tallow.

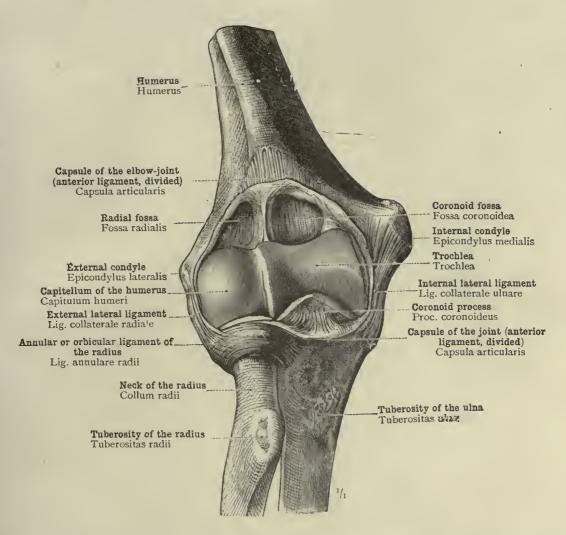


FIG. 438.—ARTICULATIO CUBITI, ELBOW-JOINT; ATTACHMENT OF THE CAPSULE TO THE ANTERIOR SURFACES OF THE HUMERUS AND THE ULNA (ANTERIOR LIGAMENT); LIGAMENTA COLLATERALIA, LATERAL LIGAMENTS; LIGAMENTUM ANNULARE RADII, ANNULAR OR ORBICULAR LIGAMENT OF THE RADIUS. (RIGHT ELBOW-JOINT; ANTERIOR OR PALMAR ASPECT.)

The capsule has been divided above and below, close to its attachment to the bones, and between the lateral ligaments (i.e., the greater portion of the anterior ligament has been removed); the cut ends of the anterior ligament have been folded back against the bones. The \*recessus sacciformis—see note on previous page—has been removed.

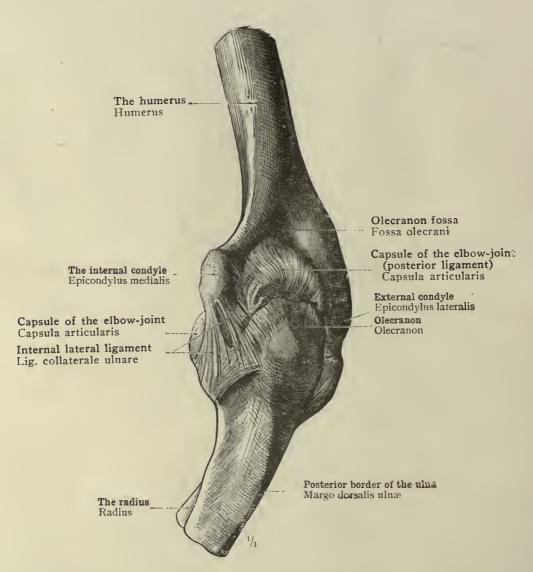


FIG. 439.—ARTICULATIO CUBITI, ELBOW-JOINT: CAPSULA ARTICULARIS, CAPSULE OF THE JOINT; LIGAMENTUM COLLATERALE ULNARE, INTERNAL LATERAL LIGAMENT. (RIGHT ELBOW-JOINT; POSTERO-INTERNAL ASPECT.)

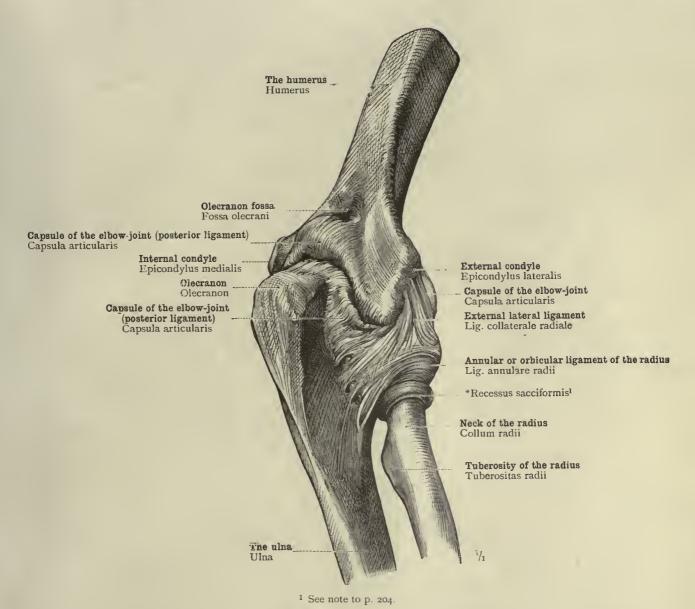


Fig. 440.—Articulatio Cubiti, Elbow-Joint: Capsula Articularis, Capsule of the Joint; Ligamentum Collaterale Radiale, External Lateral Ligament; Ligamentum Annulare Radii, Annular or Orbicular Ligament of the Radius; \*Recessus Sacciformis. (Right Elbow-Joint; Postero-External Aspect.)

The \*recessus sacciformis has been injected with tallow.

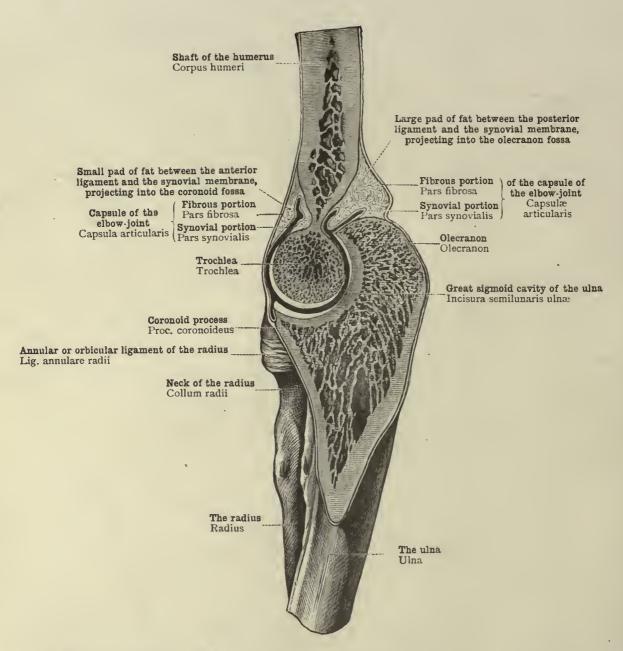


Fig. 441.—Articulatio Humero-ulnaris, Humero-ulnar Articulation. (Sagittal Section of the Right Elbow-Joint; the Radial Half is figured.)

The section passes through the trochlea and the great sigmoid cavity of the ulna, in a plane vertical to the axis of the trochlea.

Articulatio cubiti-Elbow-joint.

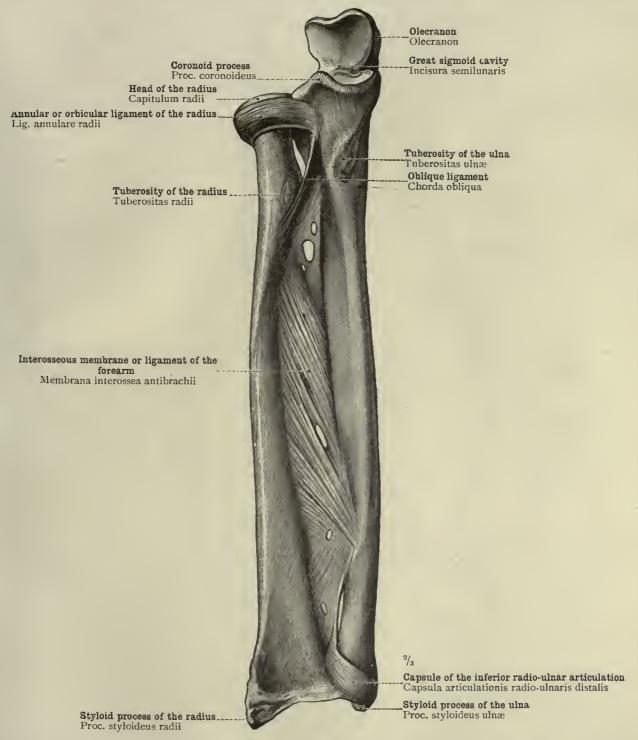


Fig. 442.—Articulationes Radio-ulnares, Proximalis et Distalis; Radio-ulnar Articulations, Superior and Inferior: Ligamentum Annulare Radii, Annular or Orbicular Ligament of the Radius; Membrana Interossea Antibrachii, Interosseous Membrane or Ligament of the Forearm. (The Bones of the Right Forearm with the Radio-ulnar Ligaments; Anterior or Palmar Aspect.)

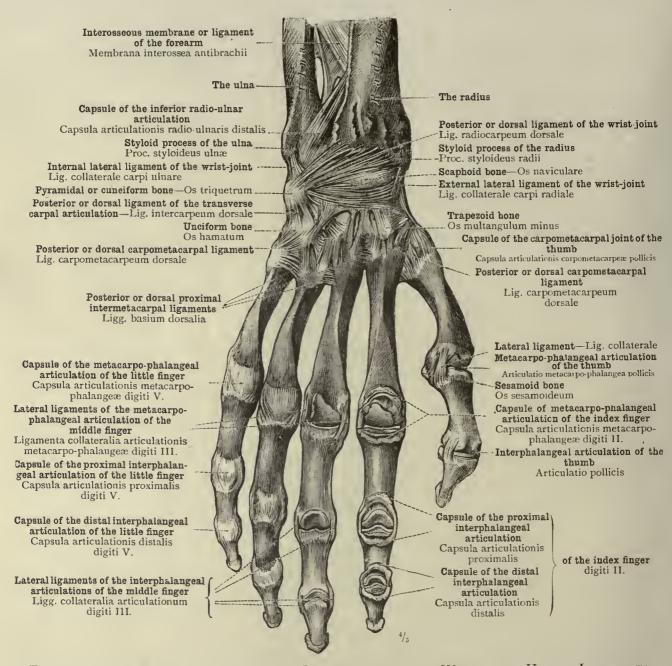
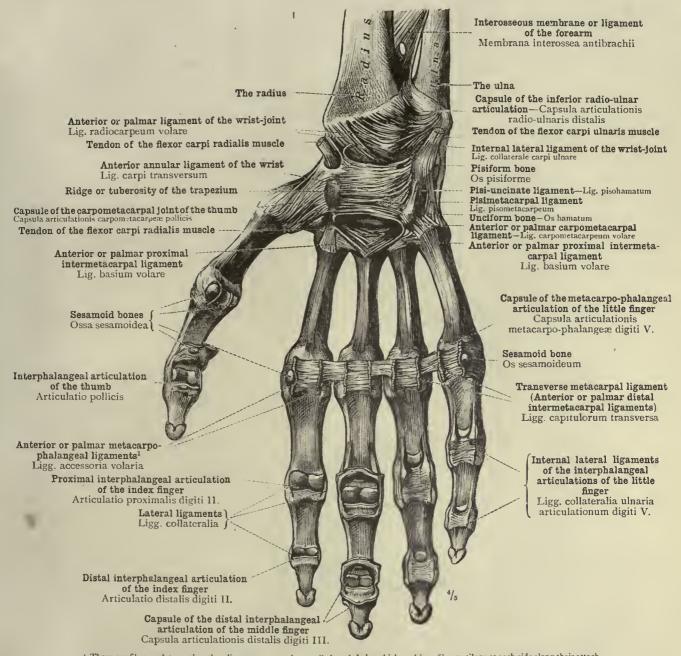


Fig. 443.—The Posterior or Dorsal Ligaments of the Wrist and Hand: Ligamenta Collateralia Carpi, Lateral Ligaments of the Wrist and the Carpus; Superficial Posterior or Dorsal Ligaments of Carpus and Metacarpus. The Capsules and the Lateral Ligaments of the Metacarpo-phalangeal and Interphalangeal Articulations.

In the articulations of the index finger the posterior wall of the capsule has been divided transversely across the middle of the joint, and the ends have been turned upwards and downwards; in the articulations of the thumb and the middle finger the capsule has been divided only between the lateral ligaments, leaving these intact; in the articulations of the ring and little fingers the capsule has not been opened.

Articulationes manus et digitorum-Articulations of the hand and fingers.



<sup>1</sup> These are fibrous plates rather than ligaments properly so called, and, being thickened into fibrocartilage at each side along their attachments to the lateral metacarpo-phalangeal ligaments, they are grooved on the palmar surfaces for the flexor tendon. Macalister calls them glenoid ligaments. It is in the lateral fibrocartilaginous portions of these plates that the sesamoid bones of the metacarpo-phalangeal joint of the thumb, and occasionally of some of the other fingers, are developed.—Tr.

FIG. 444.—THE ANTERIOR OR PALMAR LIGAMENTS OF THE WRIST AND HAND: THE SUPERFICIAL LIGAMENTS OF THE CARPUS AND THE METACARPUS; THE CAPSULES AND LIGAMENTS OF THE METACARPO-PHALANGEAL AND THE INTERPHALANGEAL ARTICULATIONS. LIGAMENTUM CARPI TRANSVERSUM, ANTERIOR ANNULAR LIGAMENT OF THE WRIST; CANALIS CARPI, CANAL OF THE CARPUS BENEATH THE ANTERIOR ANNULAR LIGAMENT (FOR THE TRANSMISSION OF THE FLEXOR TRIDONS). RELATIONS OF THE TENDONS OF THE FLEXOR CARPI ULNARIS AND FLEXOR CARPI RADIALIS MUSCLE TO THE ANTERIOR OR PALMAR CARPAL AND, METACARPAL LIGAMENTS. LIGAMENTA ACCESSORIA VOLARIA, ANTERIOR OR PALMAR METACARPO-PHALANGEAL LIGAMENTS; LIGAMENTA CAPITULORUM TRANSVERSA, TRANSVERSE METACARPAL LIGAMENT (ANTERIOR OR PALMAR DISTAL INTERMETACARPAL LIGAMENTS). OSSA SESAMOIDEA, SESAMOID BONES.

In the interphalangeal articulations of the index finger the anterior portions of the capsules between the lateral ligaments have been entirely cut away; in those of the middle finger the capsules have been divided transversely across the middle of the joint and the divided halves of the anterior ligament turned upwards and downwards; in the interphalangeal articulation of the thum's the anterior portion of the capsule has been divided along its attachment to the distal phalanx and the lateral ligaments, and, together with the sesamoid bones embedded in it on each side, has been turned upwards; in the remaining joints the capsule has been left intact.

Articulationes manus et digitorum—Articulations of the hand and fingers.

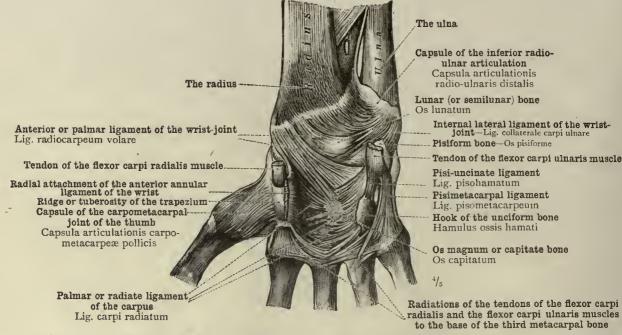
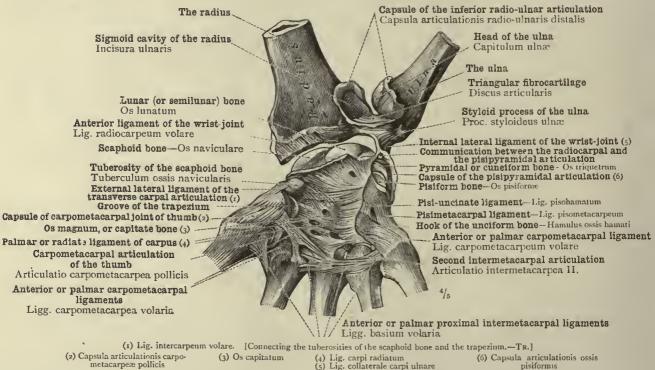


FIG. 445.—THE ANTERIOR OR PALMAR LIGAMENTS OF THE RIGHT CARPUS, SHOWN BY THE REMOVAL OF THE ANTERIOR ANNULAR LIGAMENT OF THE WRIST: LIGAMENTUM RADIOCARPEUM VOLARE, ANTERIOR OR PALMAR LIGAMENT OF THE WRIST-JOINT; LIGAMENTUM CARPI RADIATUM, ANTERIOR OR RADIATE LIGAMENT OF THE CARPUS.



metacarpeae policis (3) Os capitatum (4) Lig. carpi radiatum (5) Lig. collaterale carpi ulnare pisiforma (6) Capitatum (6) Capitatum (7) Lig. collaterale carpi ulnare pisiforma (7) AND (7) Capitatum (7) Lig. collaterale carpi ulnare pisiforma (7) AND (7) Capitatum (8) Lig. collaterale carpi ulnare pisiforma (8) Lig. collaterale carpi ulnare pisiforma (9) Capitatum (1) Lig. carpi radiatum (1) Lig. carpi radiatum

FIG. 446.—THE ANTERIOR OR PALMAR LIGAMENTS OF THE INTERCARPAL (TRANSVERSE CARPAL) AND CARPOMETACARPAL ARTICULATIONS, AFTER THE ANTERIOR ANNULAR LIGAMENT OF THE WRIST AND THE TENDONS OF THE FLEXOR CARPI RADIALIS AND FLEXOR CARPI ULNARIS HAVE BEEN ENTIRELY REMOVED.

The radiocarpal and distal radio-ulnar articulations have been opened, the triangular fibrocartilage and the internal lateral ligament of the wrist-joint being left intact; the bones of the forearm have been separated from one another and from the carpus; the pisipyramidal articulation, the carpometacarpal articulations of the thumb and the ring finger, and the second intermetacarpal articulation, have been partially opened.

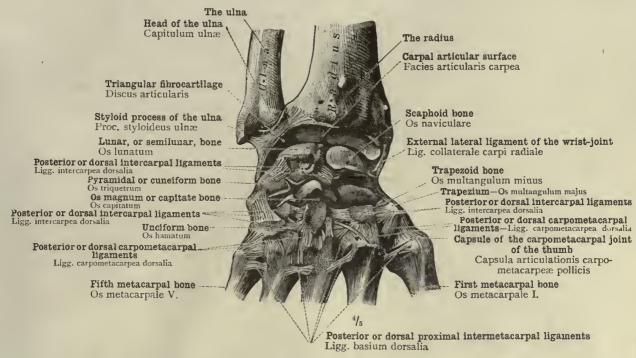


Fig. 447.—The Short Posterior or Dorsal Ligaments of the Transverse Carpal Articulation, and of the Carponetacarpal and Intermetacarpal Articulations. (The Right Carpus with the Distal Extremities of the Bones of the Forearm and the Proximal Extremities of the Metacarpal Bones.)

The distal radio-ulnar articulation and the radiocarpal and transverse carpal articulations have been opened by the removal of the posterior ligaments, and the bones of the forearm have been drawn a little upwards and away from the carpus.

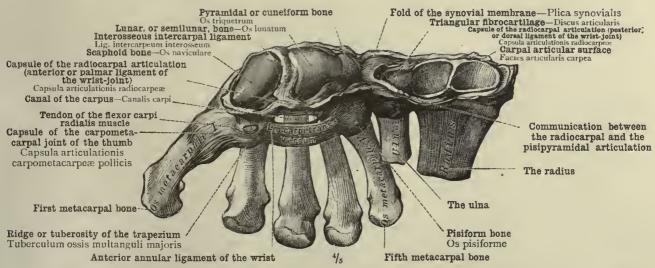


Fig. 448.—The Articular Surfaces and the Attachments of the Capsule of the Radiocarpal Articulation or Wrist-Joint; Canalis Carpi, the Canal of the Carpus. (The Right Carpus with the Metacarpal Bones; Antero-superior Aspect.)

The distal extremities of the bones of the forearm have been turned to the ulnar side, after division of the capsule of the wrist-joint with the exception of the internal lateral ligament.

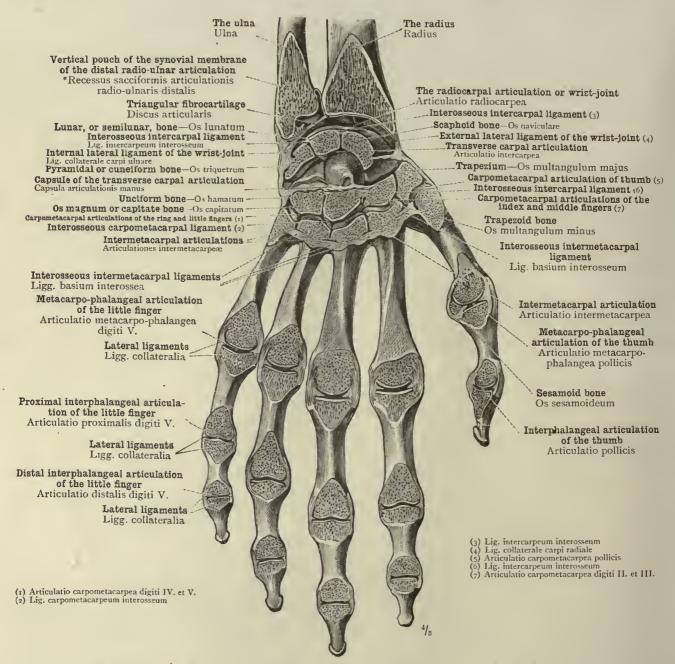


Fig. 449.—Articulation Radio-ulnaris Distalis, Distal Radio-ulnar Articulation. Articulatio Manus, Articulations of the Hand: Articulationes Radiocarpea et Intercarpea, Radiocarpal Articulation or Wrist-Joint and Transverse Carpal Articulation. Articulationes Carpometacarpeæ, Carpometacarpal Articulations; Articulationes Intermetacarpeæ, Intermetacarpal Articulations. Articulationes Metacarpo-phalangeæ, Metacarpo-phalangeal Articulations; Articulationes Digitorum Manus, Interphalangeal Articulations of the Fingers. (The Skeleton of the Right Hand with the Distal Extremities of the Bones of the Forearm; Posterior or Dorsal Aspect.)

The articulations are all opened by a section in the frontal plane: and whereas in the fingers this plane passes through the joints from side to side, dividing the lateral ligaments; in the thumb, owing to the opposition of this member, the plane of section passes through the joints in a dorsopalmar direction, and divides the dorsal and palmar ligaments.

Articulationes manus et digitorum—Articulations of the hand and fingers.

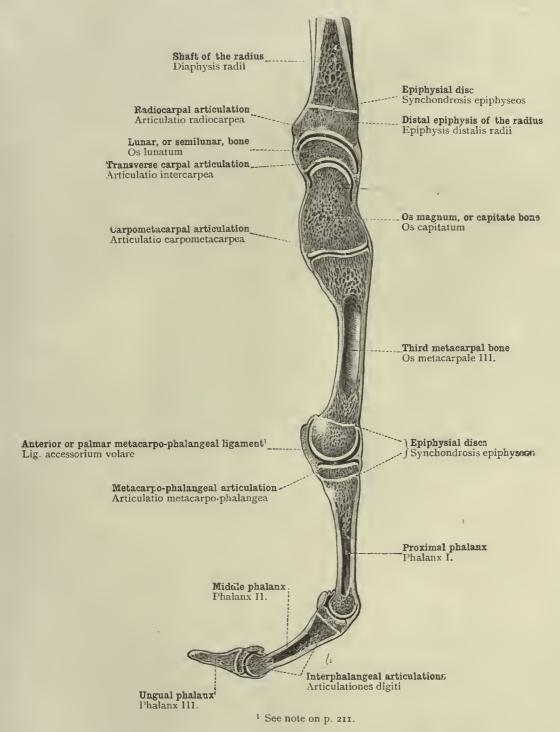
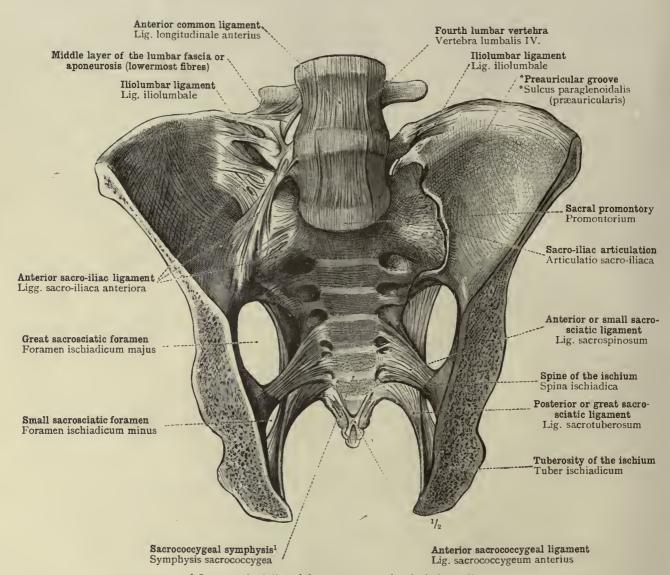


Fig. 450.—The Articulations of the Hand, seen in Sagittal or Dorsopai mar Section, showing their Relations to the Epiphysial Discs. (The Radial Portion of the Divided Right Hand of a Youth aged Seventeen Years.)

The section traverses the distal extremity of the radius, the carpus, and the metacarpal bone an phalanges of the middle finger.

Articulationes manus et digitorum—Articulations of the hand and fingers.



<sup>1</sup> Intervertebral disc of the sacrococcygeal articulation.—Tr.

FIG. 451.—ARTICULATIO SACRO-ILIACA, SACRO-ILIAC ARTICULATION: LIGAMENTA SACRO-ILIACA ANTERIORA, ANTERIOR SACRO-ILIACA LIGAMENT; LIGAMENTUM ILIOLUMBALE, ILIOLUMBAR LIGAMENT. LIGAMENTA SACROSPINOSUM ET SACROTUBEROSUM, SMALL OR ANTERIOR AND GREAT OR POSTERIOR SACROSCIATIC LIGAMENTS. FORAMINA ISCHIADICA MAJUS ET MINUS, GREAT AND SMALL SACROSCIATIC FORAMINA. (THE PELVIS WITH THE FOURTH AND FIFTH LUMBAR VERTEBRÆ, IN FRONTAL SECTION; POSTERIOR HALF, SEEN FROM BEFORE.)

The ligaments of the right sacro-iliac articulation are intact; those of the left articulation have been removed.

Articulationes et ligamenta cinguli extremitatis interioris—Articulations and ligaments of the pe vic girdle.

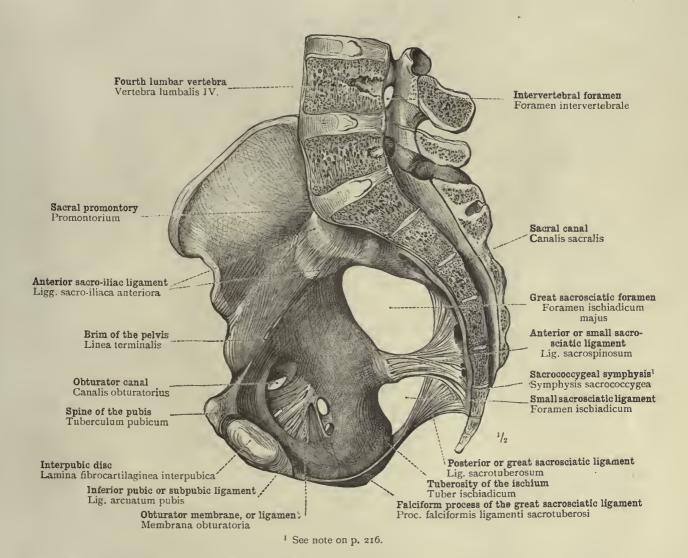
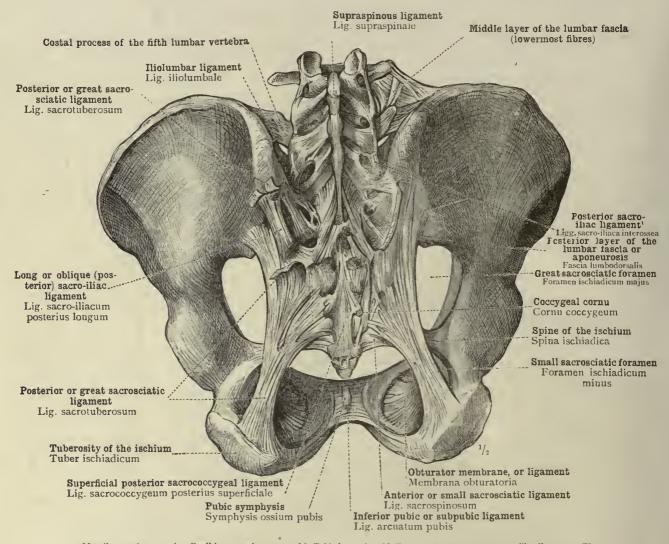


Fig. 452.—Ligamenta Sacrotuberosum et Sacrospinosum, Posterior or Great and Anterior or Small Sacrosciatic Ligaments; Foramina Ischiadica, Sacrosciatic Foramina. Membrana Obturatoria, Obturator Membrane or Ligament; Canalis Obturatorius, Obturator Canal. Articulatio Sacro-iliaca, Sacro-iliac Articulation. (The Right Half of a Pelvis divided in the Median Plane; seen from the Inner Side.)

Articulationes et ligamenta cinguli extremitatis inferioris—Articulations and ligaments of the pelvic girdle.



<sup>1</sup> Macalister and some other English anatomists agree with Toldt in naming this ligament the interesseous sacro-iliac ligament. That name is, however, misapplied, since the fibres of the ligament do not connect two closely adjacent parallel articular surfaces. True interesseous fine fibres are occasionally found connecting corresponding parts of the auricular surfaces of the sacrum and the ilium.—Tr.

FIG. 453.—Posterior Ligaments of the Pelvic Girdle: Ligamentum Sacrotuberosum, Posterior or Great Sacrosciatic Ligament, and its Relation to the Posterior Layer of the Lumbar Aponeurosis. Foramina Ischiadica, Sacrosciatic Foramina. Ligamentum Sacro-iliacum Posterius Longum, Long or Oblique (Posterior) Sacro-iliac Ligament; Ligamenta Sacro-iliac Interossea, Posterior Sacro-iliac Ligament (see note above); Ligamentum Iliolumbale, Iliolumbar Ligament. (The Pelvis with the Fourth and Fifth Lumbar Vertebræ; seen from Behind.)

On the right side, the posterior layer of the lumbar aponeurosis has been divided close to its continuation into the posterior or great sacrosciatic ligament, and turned outwards; on the left side, this superficial portion of the posterior or great sacrosciatic ligament has been cut across, and the divided ends have been turned upwards and downwards. The lowermost fibres of the middle layer of the lumbar aponeurosis have on the right side been left intact, but on the left side entirely removed.

Articulationes et ligamenta cinguli extremitatis inferioris—Articulations and ligaments of the pelvic girdle.

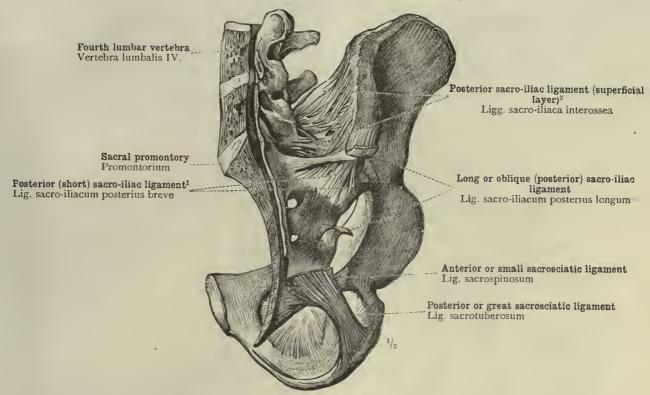


Fig. 454.—Deep Posterior Ligaments of the Sacro-Iliac Articulation: Ligamenta Sacro-Iliaca Interossea, Posterior Sacro-Iliac Ligaments; Ligamentum Sacro-Iliacum Posterius Breve, Posterior (Short) Sacro-Iliac Ligament. (The Right Half of a Pelvis divided in the Median Plane; Postero-Internal Aspect.)

The upper portion of the posterior or great sacrosciatic ligament has been removed; the long or oblique (posterior) sacro-iliac ligament has been divided transversely in the middle, and the ends have been turned upwards and downwards.

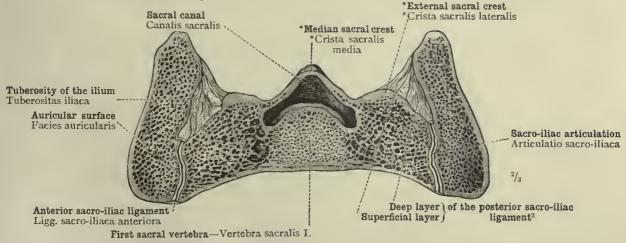
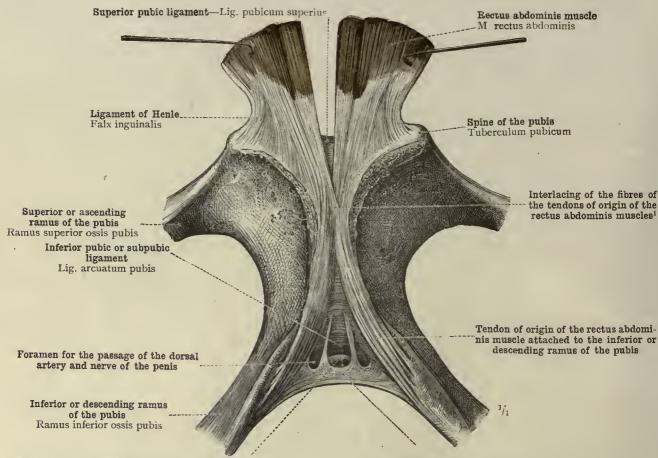


Fig. 455.—Horizontal Section through the Sacro-Iliac Articulation; Upper Surface of Lower Segment: Superficial and Deep Layers of the Posterior Sacro-Iliac Ligament.

The section was made in a plane at right angles to the long axis of the pelvis, and passes through the middle of the body of the first sacral vertebra.

<sup>1</sup> This forms part of the posterior sacro-iliac ligament of English anatomists. See note on p. 218.—Tr. <sup>2</sup> See note on p. 218.

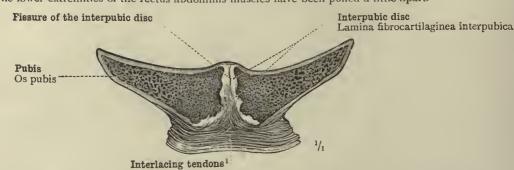
Articulationes et ligamenta cinguli extremitatis inferioris—Articulations and ligaments of the pelvic girdle.



Foramen for the passage of the dorsal vein of the penis

Transverse ligament of the pelvis2-Lig. transversum pelvis

Fig. 456.—Symphysis Ossium Pubis, Pubic Symphysis: Ligamentum Pubicus Superius, Superior Pubic Ligament; Ligamentum Arcuatum Pubis, Inferior Pubic or Subpubic Ligament; LIGAMENTUM TRANSVERSUM PELVIS, TRANSVERSE LIGAMENT OF THE PELVIS. THE ORIGIN OF THE TENDONS OF THE RECTUS ABDOMINIS MUSCLES FROM THE PUBIS, AND THE RELATION OF THESE TENDONS TO THE PUBIC SYMPHYSIS. (THE ANTERIOR ASPECT OF THE PUBIC SYMPHYSIS.) The lower extremities of the rectus abdominis muscles have been pulled a little apart.



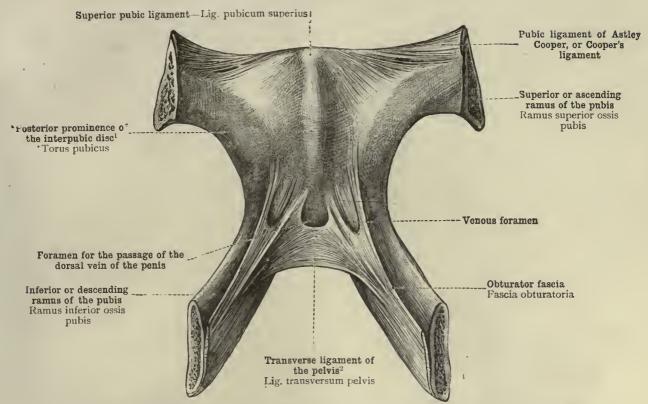
The anterior public ligament is not mentioned by the author. It consists of two parts, a superficial and a deep. The deep part, which is not shown in any of the figures, is made up of fibres passing transversely from bone to bone in front of the interpubic disc; the fibres of the superficial part are oblique, interlace freely, and are mainly derived from the tendons of the external oblique and rectus muscles of the abdomen, as well as from those of the superficial adductors of the thigh. These interlacing tendinous fibres of the superficial part of the anterior public ligament are shown in both the figures on this page.—Tr.

2 This ligament is a portion of the deep perineal fascia or triangular ligament of the urethra. The name of transverse ligament of the pelvis, which is rarely used in England, was given to it by Henle.—Tr.

Fig. 457.—Horizontal Section through the Pubic Symphysis of a Nulliparous Woman aged TWENTY-ONE YEARS; UPPER SURFACE OF LOWER SEGMENT: LAMINA FIBROCARTILAGINEA INTERPUBICA, INTERPUBIC DISC; FISSURE IN THE INTERPUBIC DISC. RE-INFORCEMENT OF THE INTERPUBIC ARTICULATION BY THE INTERLACING ON ITS ANTERIOR SURFACE OF THE FIBRES OF THE TENDONS OF ORIGIN OF THE RECTUS ABDOMINIS MUSCLES AND THE TENDONS OF Insertion of the External Oblique Muscles.

The plane of section lies in the upper half of the symphysis.

Symphysis ossium pubis—Pubic symphysis.



The slight posterior prominence of the interpubic disc has not received any name from English anatomists. A few transverse fibres connect the pubic hones in this region, forming the posterior pubic ligament, which is not mentioned by Toldt.—Tr.

2 See note 2 on p. 220.

Fig. 458.—Symphysis Ossium Pubis, Pubic Symphysis: Torus Pubicus, Posterior Prominence of the Interpubic Disc; Ligamentum Transversum Pelvis, Transverse Ligament of the Pelvis (see note 2 above), with the Venous Foramina; Connexions of the Transverse Ligament of the Pelvis with the Obturator Fascia. (The Pubic Symphysis seen from Behind.)

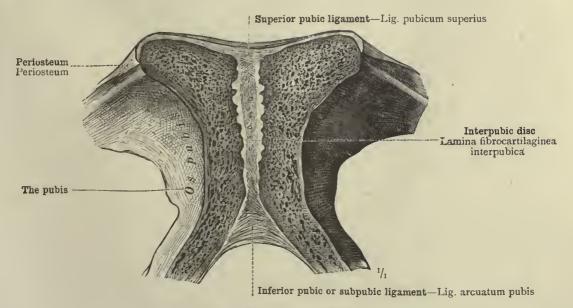


Fig. 459.—Symphysis Ossium Pubis, Pubic Symphysis: Lamina Fibrocartilaginea Interpubica, Interpubic Disc; Ligamentum Pubicum Superius, Superior Pubic Ligament; Ligamentum Arcuatum Pubis, Inferior Pubic or Subpubic Ligament. (The Pubic Symphysis in Frontal Section; Anterior Surface of Posterior Segment.)

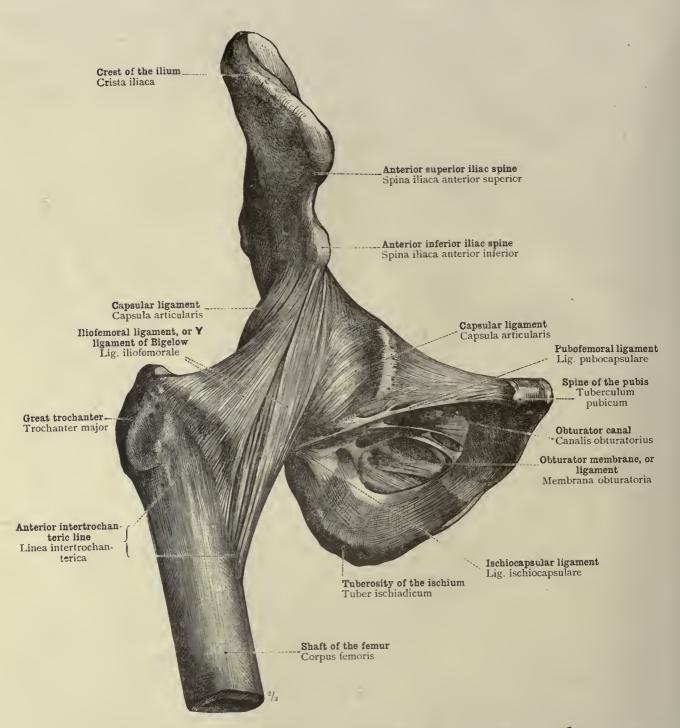


Fig. 460.—Articulatio Coxæ, the Hip-Joint: Ligamentum Iliofemorale, Iliofemoral Ligament, or Y Ligament of Bigelow; Ligamentum Pubocapsulare, Pubofemoral Ligament, and its Relations to the Obturator Membrane. (The Right Hip-Joint, seen from Before.)

Articulatio coxæ-The hip-joint.

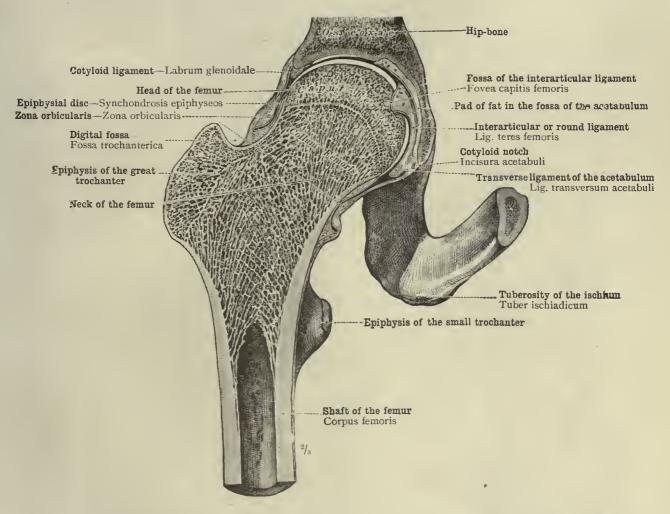


FIG. 461.—ARTICULATIO COXE, THE HIP-JOINT: CAPSULA ARTICULARIS, CAPSULAR LIGAMENT; ZONA ORBICULARIS, THE CIRCULARLY DISPOSED FIBRES OF THE CAPSULAR LIGAMENT, FORMING A BAND ROUND THE NECK OF THE FEMUR, WHICH IS MOST DISTINCT BEHIND AND BELOW. RELATION OF THE EPIPHYSIAL DISC OF THE HEAD OF THE FEMUR TO THE HIP-JOINT. (THE RIGHT HIP-JOINT IN FRONTAL SECTION; ANTERIOR SURFACE OF POSTERIOR SEGMENT.)

The section passes through the middle of the cotyloid notch and of the fossa of the interarticular ligament.

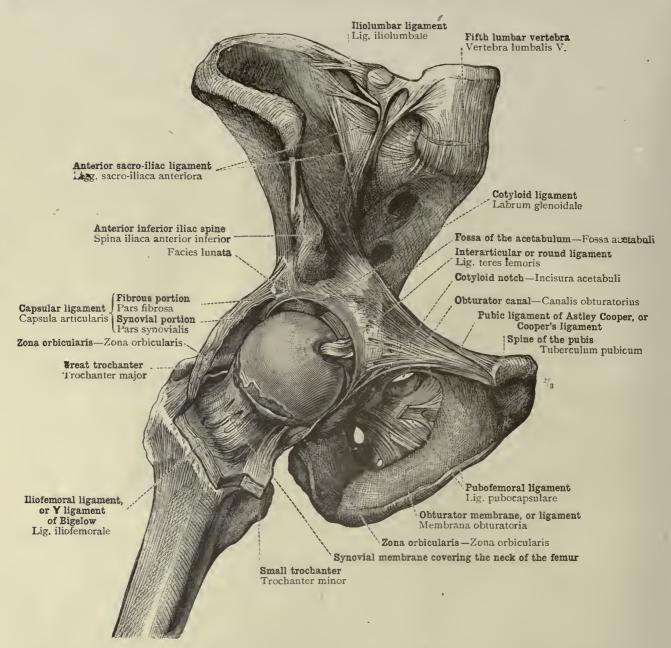


FIG. 462.—ARTICULATIO COXÆ, THE HIP-JOINT; LIGAMENTUM TERES FEMORIS, INTERARTICULAR OR ROUND LIGAMENT OF THE HIP-JOINT<sup>1</sup>; LABRUM GLENOIDALE, COTYLOID LIGAMENT; CAPSULA ARTICULARIS, CAPSULAR LIGAMENT OF THE HIP-JOINT; REFLECTION OF THE SYNOVIAL MEMBRANE OF THE HIP-JOINT FROM THE INNER SURFACE OF THE CAPSULAR LIGAMENT ON TO THE NECK OF THE FEMUR; ZONA ÜRBICULARIS, CIRCULAR BAND OF THE CAPSULAR LIGAMENT ROUND THE NECK OF THE FEMUR.<sup>2</sup> (THE RIGHT HIP-JOINT SEEN FROM BEFORE.)

The anterior wall of the capsular ligament has been removed, except for a narrow band at its distal attachment, which has been turned outwards. The head of the femur has been slightly withdrawn from its socket in a downward and outward direction.

1 Perhaps most frequently known in England by its Latin name, ligamentum teres.

<sup>2</sup> Also frequently known in England by its Latin name, zona orbicularis.

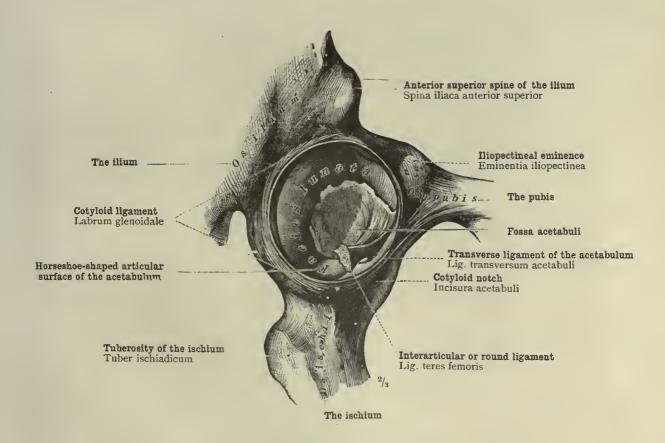


Fig. 463.—Articulatio Coxæ, the Hip-Joint: the Acetabulum; Labrum Glenoidale et Ligamentum Transversum Acetabuli, the Cotyloid Ligament and the Transverse Ligament of the Acetabulum. Ligamentum Teres Femoris, the Interarticular or Round Ligament. (View of the Interior of the Socket of the Right Hip-Joint.)

The interarticular or round ligament has been divided close to its attachment to the head of the femur.

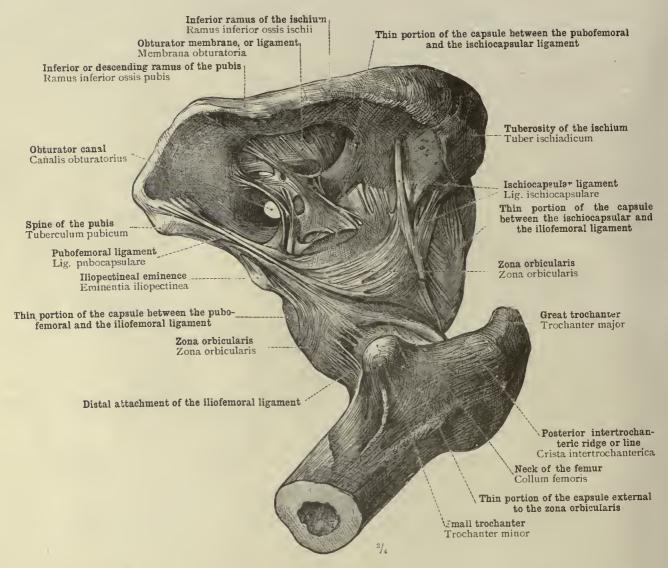


Fig. 464.—Articulatio Coxæ, the Hip-Joint: Capsula Articularis, the Capsular Ligament; Zona Orbicularis (see p. 223), and its Relations to the Pubofemoral and Ischiocapsular Ligaments. Membrana Obturatoria et Canalis Obturatorius, Obturator Membrane or Ligament and Obturator Canal. (The Postero-Internal Side of the Right Hip-Joint seen from Below.)

The articular cavity has been injected with tallow.

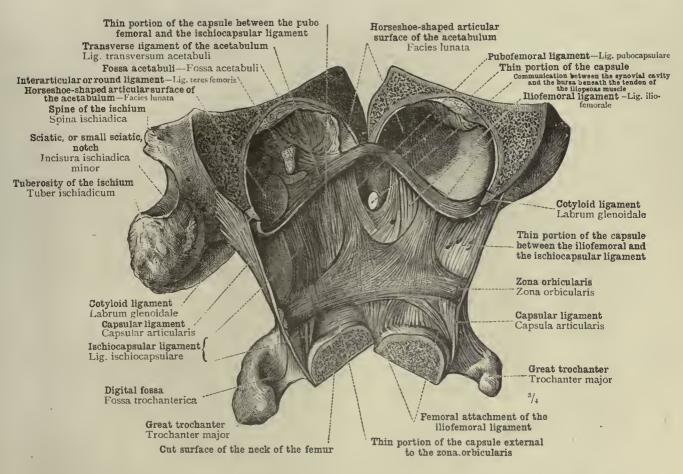


FIG. 465.—ARTICULATIO COXE, THE HIP-JOINT: ZONA ORBICULARIS (see p. 223), AND ITS RELATIONS TO THE ILIOFEMORAL, PUBOFEMORAL, AND ISCHIOCAPSULAR LIGAMENTS; THE THIN PORTIONS OF THE CAPSULE, AND THE COMMUNICATION BETWEEN THE SYNOVIAL CAVITY AND THE BURSA BENEATH THE TENDON OF THE ILIOPSOAS MUSCLE; THE ACETABULUM, WITH THE TRANSVERSE LIGAMENT OF THE ACETABULUM, AND THE INTERARTICULAR OR ROUND LIGAMENT.

After the capsule of the right hip-joint had been prepared from without, the joint was fully flexed; the capsule was then divided by a section in the direction of a line passing from the middle of the upper border of the great trochanter to the inner border of the iliopectineal eminence; the ilium was cut away except for that portion of the bone which contributes to the formation of the acetabulum, and the neck of the femur was sawn across just internal to the distal attachment of the capsule; the interarticular ligament was divided close to the head of the femur, and this latter, together with the intracapsular portion of the neck, was removed; the acetabulum and the remaining proximal portion of the femur were divided in two by a continuation of the section already made through the upper wall of the capsule; the two halves of the acetabulum and the head and neck of the femur were then opened out till the cut surfaces met at a very obtuse angle; so that the capsule and the cotyloid ligament were fully exposed from within. The synovial membrane was dissected off, and the inner surface of the capsule cleaned from fat and cellular tissue.

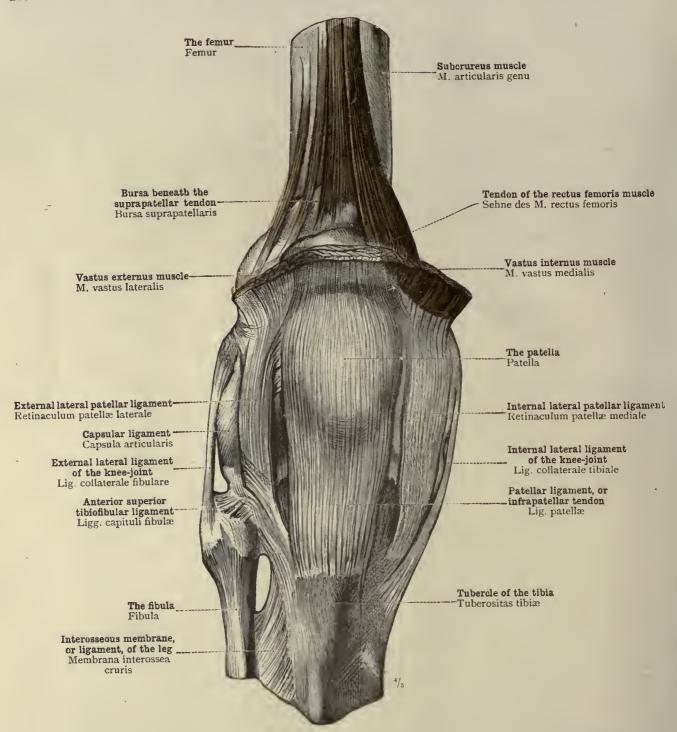


Fig. 466.—Articulatio Genu, the Knee-Joint: Ligamentum Patellæ, Patellar Ligament, or Infrapatellar Tendon; Retinacula Patellæ, Lateral Patellar Ligaments; Ligamenta Collateralia, Lateral Ligaments of the Knee-Joint. Bursa Suprapatellaris, the Bursa beneath the Suprapatellar Tendon; the Relation of the unusually Large Subcrureus Muscle to the Capsule of the Knee-Joint. Articulatio Tibiofibularis, Superior Tibiofibular Articulation: Ligamenta Capituli Fibulæ, Anterior Superior Tibiofibular Ligament. (The Right Knee-Joint from Before.)

The synovial cavity has been injected with tallow.

Articulatio genu-The knee-joint.

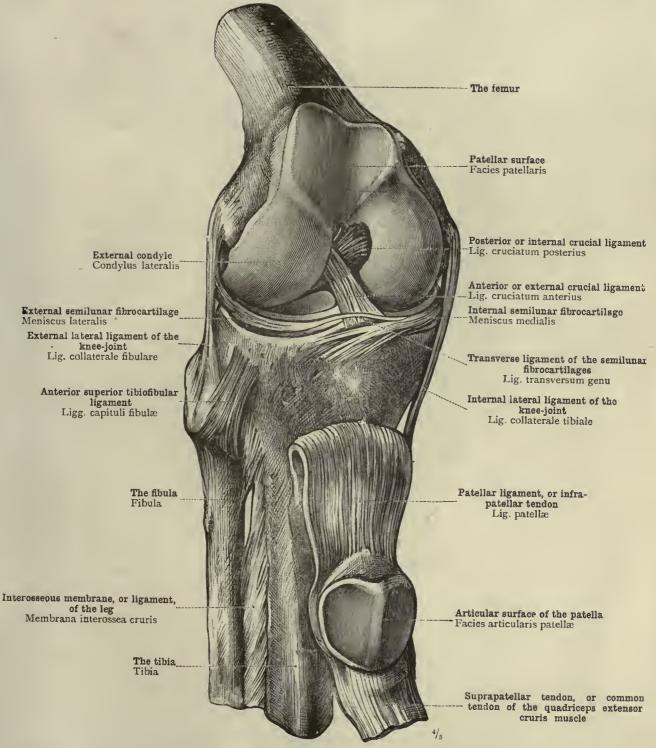


Fig. 467.—Articulatio Genu, the Knee-Joint: Ligamenta Collateralia, Lateral Ligaments of the Knee-Joint; Ligamenta Cruciata, Crucial Ligaments; Ligamentum Patellæ, Patellar Ligament, or Infrapatellar Tendon. Articulatio Tibiofibularis. Superior Tibiofibular Articulation: Ligamenta Capituli Fibulæ, Anterior Superior Tibiofibular Ligament. (The Right Knee-Joint seen from Before and Without.)

The capsular ligament has been removed from the front of the joint between the two lateral ligaments, and the patellar ligament has been turned downwards.

Articulatio genu-The knee-joint.



Fig. 468.—Articulatio Genu, the Knee-Joint: Capsula Articularis, Capsular Ligament, and the Relations of the Subcrureus Muscle to this Ligament; Bursa Suprapatellaris, the Bursa beneath the Suprapatellar Tendon. Ligamentum Collaterale Tibiæ, Internal Lateral Ligament of the Knee-Joint; Ligamentum Patellæ et Retinaculum Patellæ Mediale, Patellar Ligament, or Infrapatellar Tendon, and Internal Lateral Patellar Ligament. Relations of the Epiphysial Discs to the Articulation.

The same preparation as that of Fig. 466, seen from within.

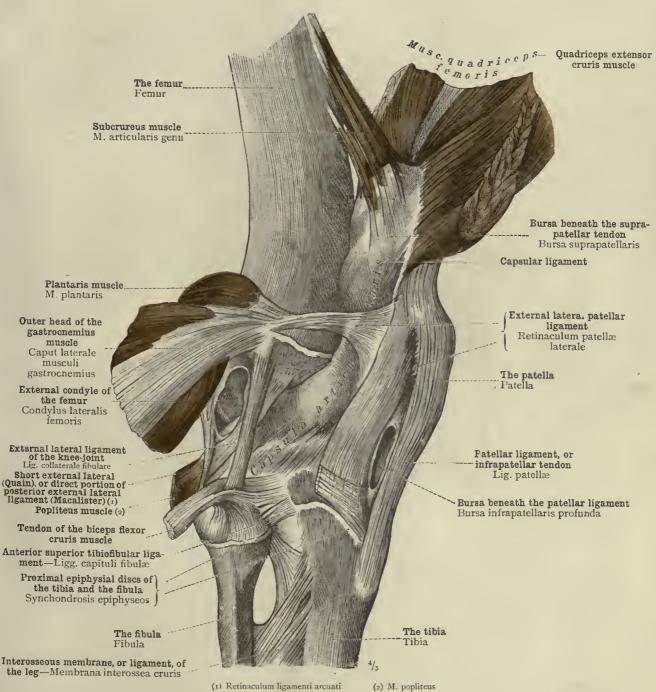


Fig. 469.—Articulatio Genu, the Knee-Joint: Capsula Articularis, Capsular Ligament; Bursa Suprapatellaris, and the Relations of the Quadriceps Extensor Cruris Muscle to the Same. Ligamentum Collaterale Fibulare, External Lateral Ligament of the Knee-Joint. Ligamentum Patellæ et Retinaculum Patellæ Laterale, Patellar Ligament, or Infrapatellar Tendon, and External Lateral Patellar Ligament; the Relations of the Latter to the Plantaris Muscle and to the Outer Head of the Gastrocnemius Muscle. Bursa Infrapatellaris Profunda, Bursa beneath the Patellar Ligament. Articulatio Tibiofibularis, Superior Tibiofibular Articulation. Ligamenta Capituli Fibulæ, Anterior Superior Tibiofibular Ligament. Relations of the Epiphysial Discs to Both the Ioints.

The same preparation as that of Figs. 466 and 468, seen from the outer side. The synovial cavity of the knee-joint has been opened behind the external lateral ligament of the knee-joint, and the bursa beneath the patellar ligament has also been opened.

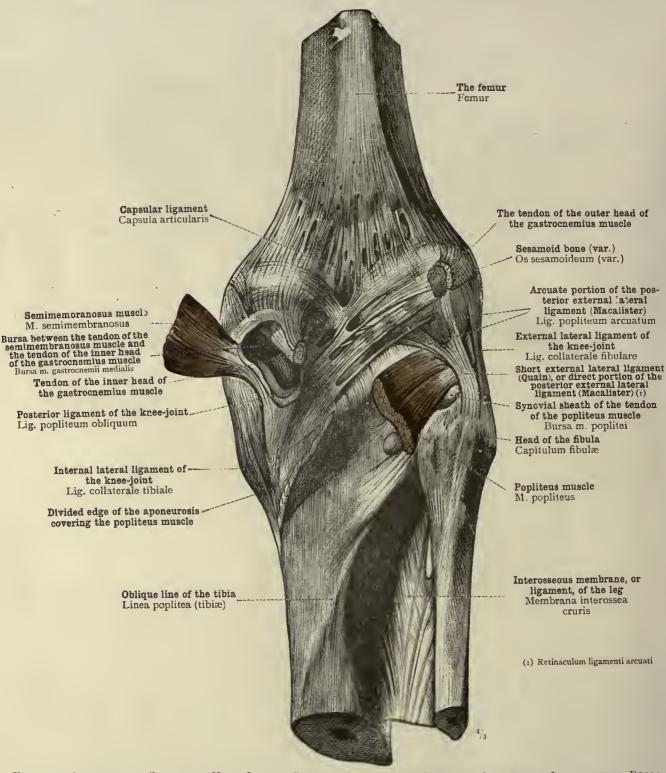


FIG. 470.—ARTICULATIO GENU, THE KNEE-JOINT: CAPSULA ARTICULARIS, CAPSULAR LIGAMENT; LIGAMENTUM POPLITEUM OBLIQUUM, POSTERIOR LIGAMENT OF THE KNEE-JOINT; RELATIONS OF THIS LIGAMENT TO THE TENDON OF THE SEMIMEMBRANOSUS MUSCLE AND TO THE OUTER HEAD OF THE GASTROCNEMIUS MUSCLE; LIGAMENTUM POPLITEUM ARCUATUM ET RETINACULUM LIGAMENTI ARCUATI, ARCUATE PORTION OF THE POSTERIOR EXTERNAL LATERAL LIGAMENT (MACALISTER), AND SHORT EXTERNAL LATERAL LIGAMENT (QUAIN), OR DIRECT PORTION OF THE POSTERIOR EXTERNAL LATERAL LIGAMENT (MACALISTER). BURSA MUSCULI GASTROCNEMII MEDIALIS, BURSA BETWEEN THE TENDON OF THE SEMIMEMBRANOSUS MUSCLE AND THE TENDON OF THE INNER HEAD OF THE GASTROCNEMIUS MUSCLE, COMMUNICATING WITH THE KNEE-JOINT AND HAVING A COMMON CAVITY WITH THE BURSA BETWEEN THE TENDON OF THE SEMIMEMBRANOSUS MUSCLE AND THE KNEE-JOINT. BURSA MUSCULI POPLITEI, SYNOVIAL SHEATH OF THE TENDON OF THE POPLITEUS MUSCLE. (THE RIGHT KNEE-JOINT, SEEN FROM BEHIND.)

Articulatio genu-The knee-joint.

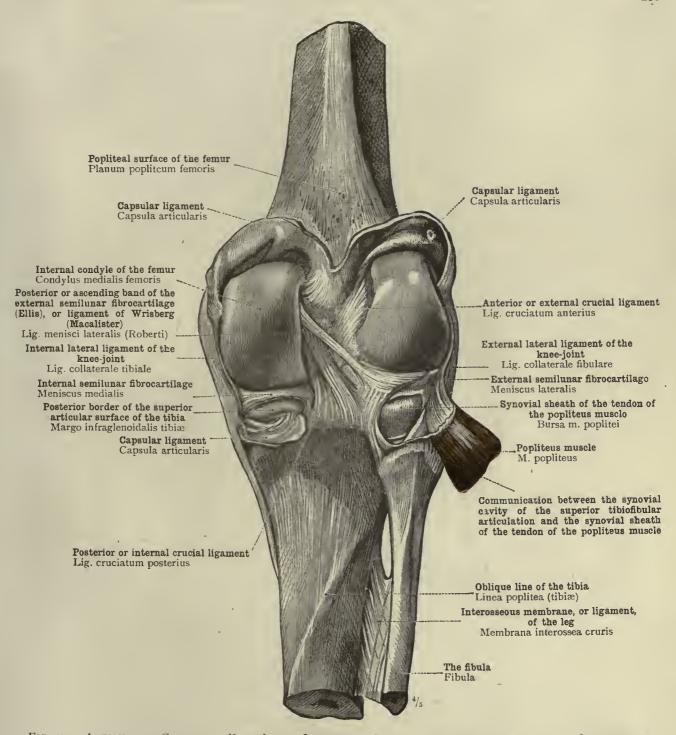


FIG. 471.—ARTICULATIO GENU, THE KNEE-JOINT: LIGAMENTA CRUCIATA, CRUCIAL LIGAMENTS, AND LIGAMENTUM MENISCI LATERALIS, POSTERIOR OR ASCENDING BAND OF THE EXTERNAL SEMILUNAR FIBROCARTILAGE (ELLIS) OR LIGAMENT OF WRISBERG (MACALISTER), (VARIETY'). COMMUNICATION OF THE SYNOVIAL SHEATH OF THE TENDON OF THE POPLITEUS MUSCLE WITH THE SYNOVIAL CAVITIES OF THE KNEE-JOINT AND OF THE SUPERIOR TIBIOFIBULAR ARTICULATION. (THE RIGHT KNEE-JOINT, SEEN FROM BEHIND.)

The posterior portion of the capsular ligament, between the external and internal lateral ligaments, has been removed, except for a strip left above close to the femoral attachment, which has been turned upwards; the synovial sheath of the tendon of the popliteus muscle has been opened at its inner side, and its posterior wall has been turned outwards with the tendon and the proximal portion of the popliteus muscle.

Though this band is called a variety by Toldt, it is, in fact, usualty present, but its situation varies; inasmuch as it passes, sometimes behind (as here), and sometimes before, and sometimes as a double band behind and before, the posterior or internal crucial ligament. Its strength and thickness varies much, but it is seldom entirely wanting.—Tr.

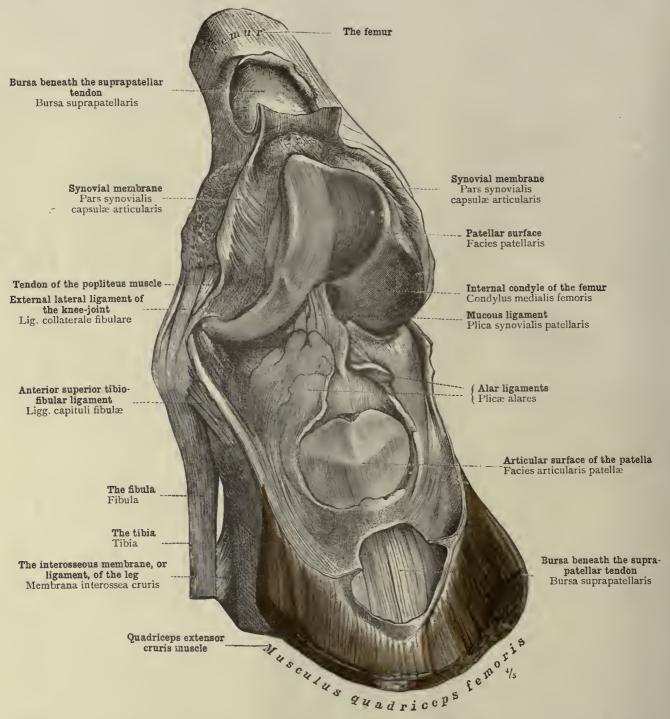


Fig. 472.—Articulatio Genu, the Knee-Joint: Pars Synovialis Capsulæ Articularis, Synovial Membrane of the Knee-Joint; Plica Synovialis Patellaris, Mucous Ligament; Plicæ Alares, Alar Ligaments; Bursa Suprapatellaris, Bursa beneath the Suprapatellar Tendon. (The Right Knee-Joint, seen from Before and Without.)

The joint was first injected, and the injected material allowed to solidify; the capsule of the joint was then prepared from without, the quadriceps extensor cruris muscle being left intact; subsequently the joint was opened by a section passing through the quadriceps muscle and the upper part of the front of the capsule from one lateral ligament to the other close to the attachment of the capsule to the femur, and the anterior wall of the joint together with the distal portion of the quadriceps extensor muscle was turned down. The quadriceps was divided at a somewhat higher level than the capsule, and the bursa beneath the suprapatellar tendon divided is the frontal plane, to show the communication of this bursa with the joint.

Articulatio genu-The knee-joint.

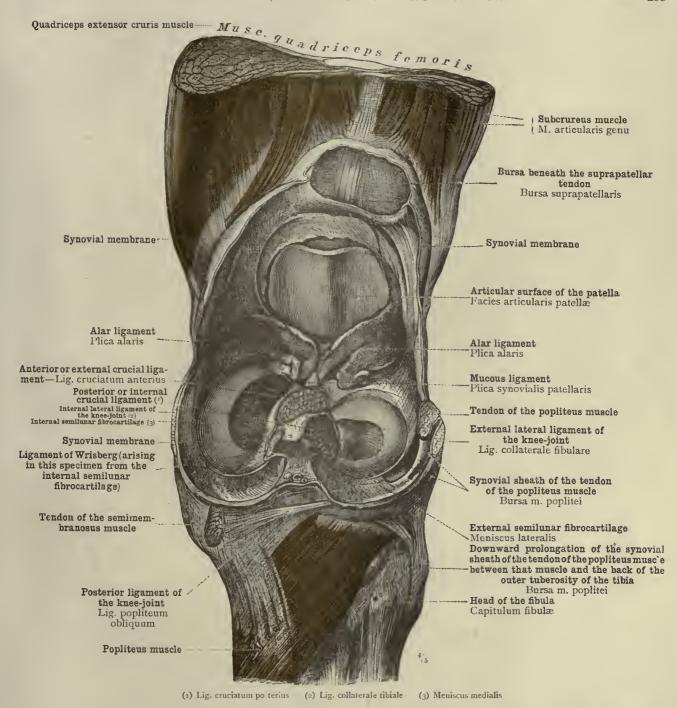


Fig. 473.—Articulatio Genu, the Knee-Joint: The Semilunar Fibrocartilages, the Alar Ligaments, and the Mucous Ligament; the Insertion into the Synovial Membrane of the Subcrureus Muscle; the Extension of the Synovial Membrane of the Knee-Joint to form the Synovial Sheath of the Tendon of the Popliteus Muscle and the Bursa between that Muscle and the Posterior Surface of the Outer Tuberosity of the Tibia, and the Relation of the Synovial Sheath of the Tendon to the External Lateral Ligament of the Knee-Joint. (The Proximal Extremities of the Bones of the Leg with the Anterior Wall of the Capsule of the Knee-Joint seen from Behind.)

After the joint had been injected, and the injected material allowed to solidify, the capsule of the joint was prepared from without, the quadriceps extensor cruris muscle being left intact; the lateral ligaments and the tendon of the populeus nuscle were then divided, and the capsule was opened behind and on either side at a higher level than the semilunar cartilages, and was divided in front along the line of its reflection on to the anterior surface of the femur; after division of the crucial ligam its, the femur was removed.

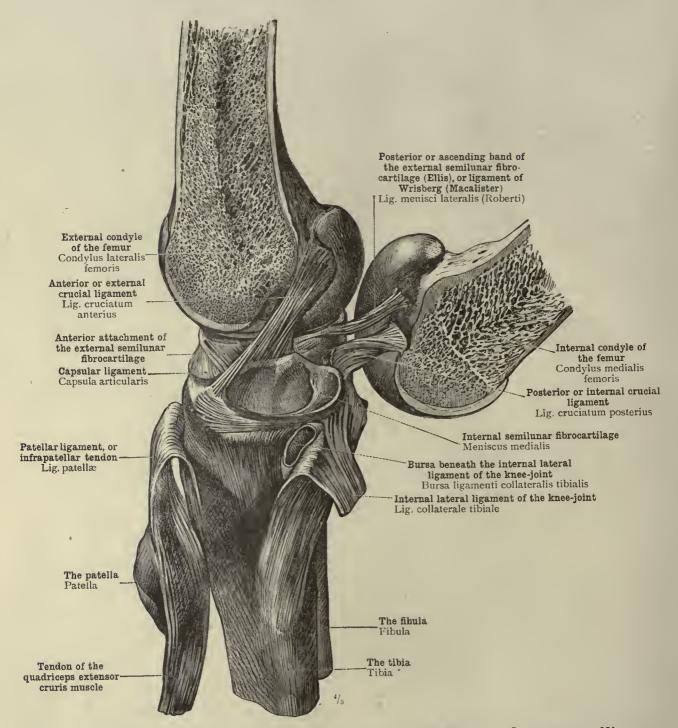


Fig. 474.—Articulatio Genu, the Knee-Joint: Crucial Ligaments and Ligament of Wrisberg; Bursa beneath the Internal Lateral Ligament of the Knee-Joint. (The Right Knee-Joint seen from the Inner Side.)

The capsule was removed, the patellar ligament and the internal lateral ligament were turned downwards: the femur was divided sagittally through the middle of the intercondylar fossa, and the external condyle placed in the position it occupies during extension of the knee-joint, while the internal condyle was turned backwards and rotated on its median axis to the extent of 180°.

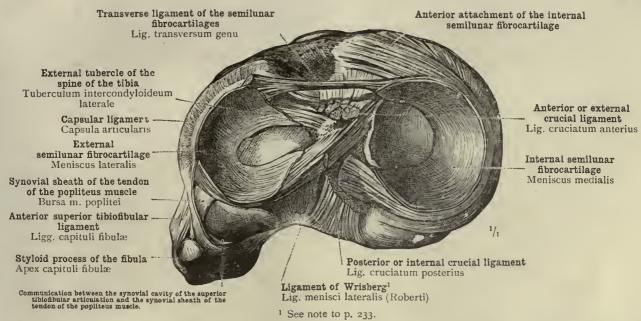


FIG. 475.—THE DISTAL ARTICULAR SURFACES OF THE KNEE-JOINT: THE INTERARTICULAR SEMI-LUNAR FIBROCARTILAGES, AND THE EXTENSION OF THE ANTERIOR EXTREMITIES OF THESE IN THE TRANSVERSE LIGAMENT OF THE SEMILUNAR FIBROCARTILAGES. THE COMMUNICATION BETWEEN THE SUPERIOR TIBIOFIBULAR ARTICULATION AND THE SYNOVIAL SHEATH OF THE TENDON OF THE POPLITEUS MUSCLE. (THE PROXIMAL EXTREMITY OF THE LEFT TIBIA WITH THE SEMI-LUNAR FIBROCARTILAGES AND THE HEAD OF THE FIBULA, SEEN FROM ABOVE.)

The capsule was divided above (proximal to) the semilunar fibrocartilages, the crucial ligaments were cut across, and the femur was removed.

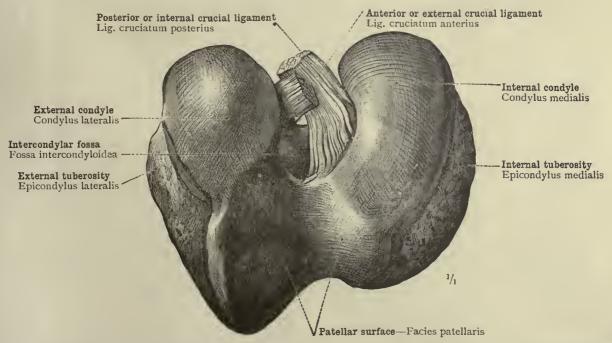


Fig. 476.—The Proximal Articular Surfaces of the Knee-Joint, and the Femoral Attachments of the Crucial Ligaments.

The distal extremity of the femur removed from the preparation shown in Fig. 475, seen from below.

Articulatio genu-The knee-joint.

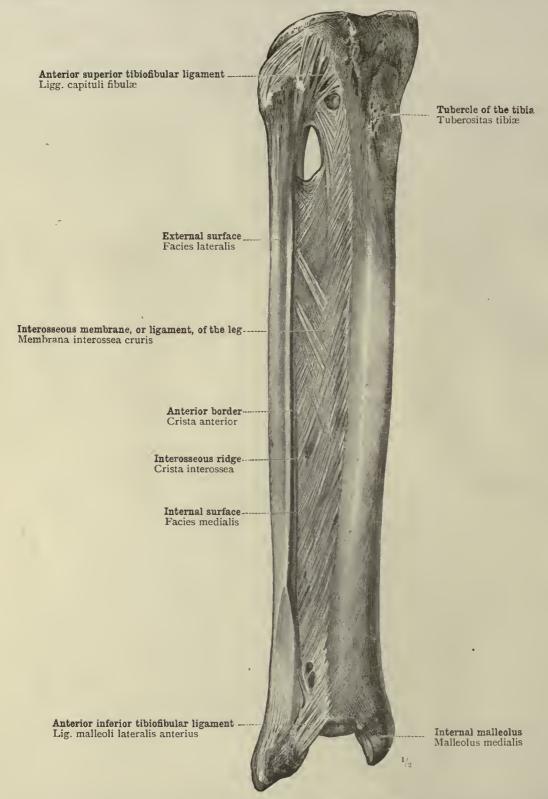


FIG. 477.—ARTICULATIO TIBIOFIBULARIS ET SYNDESMOSIS TIBIOFIBULARIS, THE TIBIOFIBULAR ARTICULATIONS. THE INTEROSSEOUS MEMBRANE, OR LIGAMENT, OF THE RIGHT LEG; THE ANTERIOR SUPERIOR AND ANTERIOR INFERIOR TIBIOFIBULAR LIGAMENTS. (SEEN FROM BEFORE.)

The Tibiofibular Articulations.

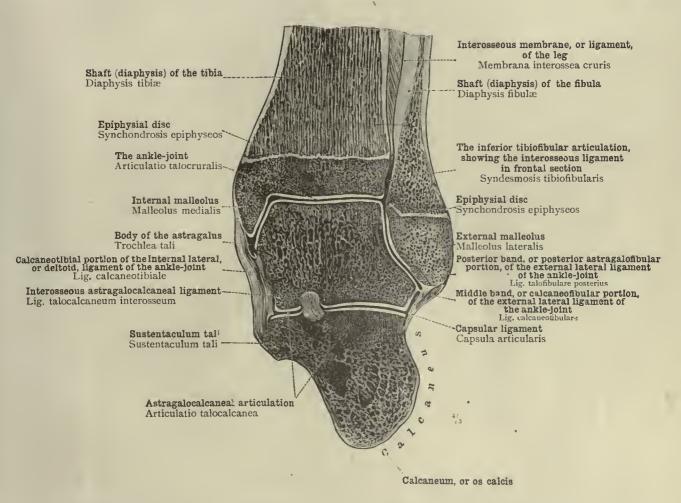


Fig. 478.—Articulationes Talocruralis et Talocalcanea, the Ankle-Joint and the Astragalocalcaneal Articulation; Syndesmosis Tibiofibularis, Inferior Tibiofibular Articulation, showing the Interosseous Ligament. The Relations of the Distal Epiphysial Discs of the Tibia and the Fibula to the Ankle-Joint. (The Ankle-Joint and the Astragalocalcaneal Articulation of the Right Leg, divided in a Vertical Plane closely approximating the Frontal Plane; Posterior Surface of the Anterior Segment.)

The plane of section passes through the lowermost parts of the lateral portions of the superior articular surface of the astragalus.

Articulationes pedis—The articulations of the foot.

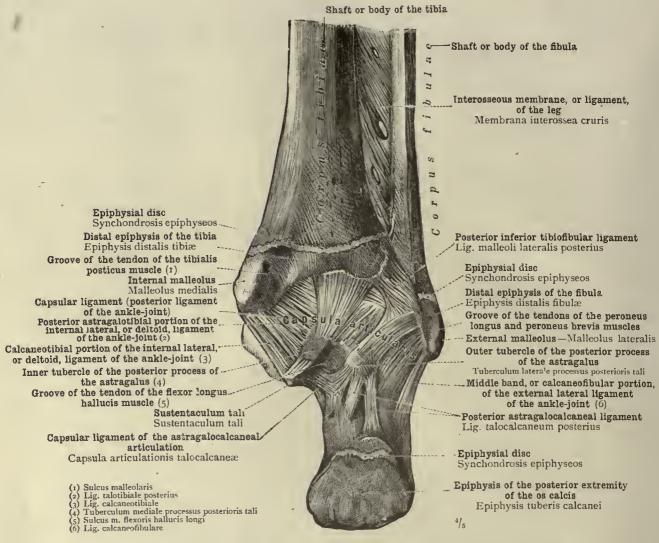


Fig. 479.—The Capsular Ligaments and the Superficial Posterior Ligaments of the Ankle-Joint and of the Astragalocalcaneal Articulation. The Relations of the Distal Epiphysial Discs of the Tibia and Fibula to the Ankle-Joint. The Posterior Portions of the Lateral Ligaments of the Ankle-Joint: Ligamentum Talotibiale Posterius, the Posterior Astragalotibial Portion of the Internal Lateral, or Deltoid, Ligament of the Ankle-Joint; Ligamentum Calcaneotibiale, the Calcaneotibial Portion of the Internal Lateral, or Deltoid, Ligament of the Ankle-Joint; Ligamentum Calcaneofibulare, the Middle Band, or Calcaneofibular Portion, of the External Lateral Ligament of the Ankle-Joint. Ligamentum Talocalcaneum Posterius, the Posterior Astragalocalcaneal Ligament.—Syndesmosis Tibiofibularis: Ligamentum Malleoli Lateralis Posterius, the Posterior Inferior Tibiofibular Ligament. (The Ankle-Joint and the Astragalocalcaneal Articulation of the Right Leg, seen from Behind.)

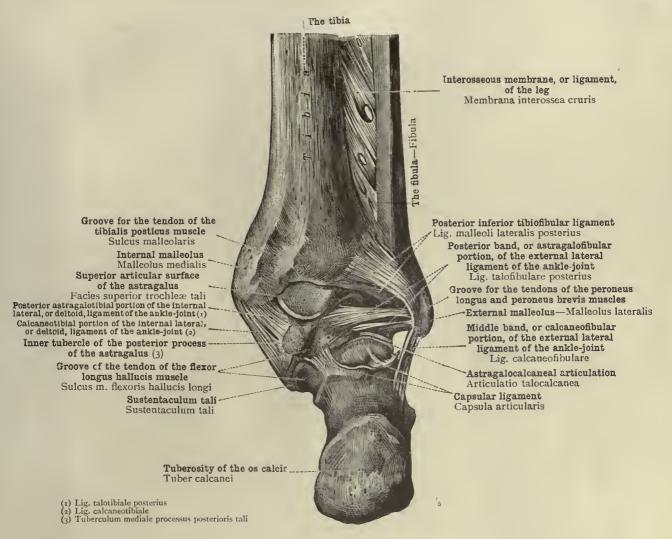


Fig. 480.—Articulationes Talocruralis et Talocalcanea, the Ankle-Joint and the AstragaLocalcaneal Articulation; Syndesmosis Tibiofibularis, the Inferior Tibiofibular
Articulation: Ligamentum Malleoli Lateralis Posterius, the Posterior Inferior
Tibiofibular Ligament. The Posterior Portions of the Lateral Ligaments:
Ligamentum Talotibiale Posterius, the Posterior Astragalotibial Portion of the
Internal Lateral, or Deltoid, Ligament of the Ankle-Joint; Ligamentum Calcaneotibiale, the Calcaneotibial Portion of the Internal Lateral, or Deltoid, Ligament
of the Ankle-Joint; Ligamentum Talofibulare Posterius, the Posterior Band, or
Astragalofibular Portion, of the External Lateral Ligament of the Ankle-Joint;
Ligamentum Calcaneofibulare, the Middle Band, or Calcaneofibular Portion, of the
External Lateral Ligament of the Ankle-Joint. (The Ankle-Joint and the Astragalocalcaneal Articulation of the Right Leg, seen from Behind.)

The thin posterior portion of the capsule of the ankle-joint has been removed. The posterior portion of the capsule of the astragalocalcaneal articulation has been separated from its attachment to the astragalus external to its attachment to the posterior process of that bone, and turned backwards on to the os calcis.

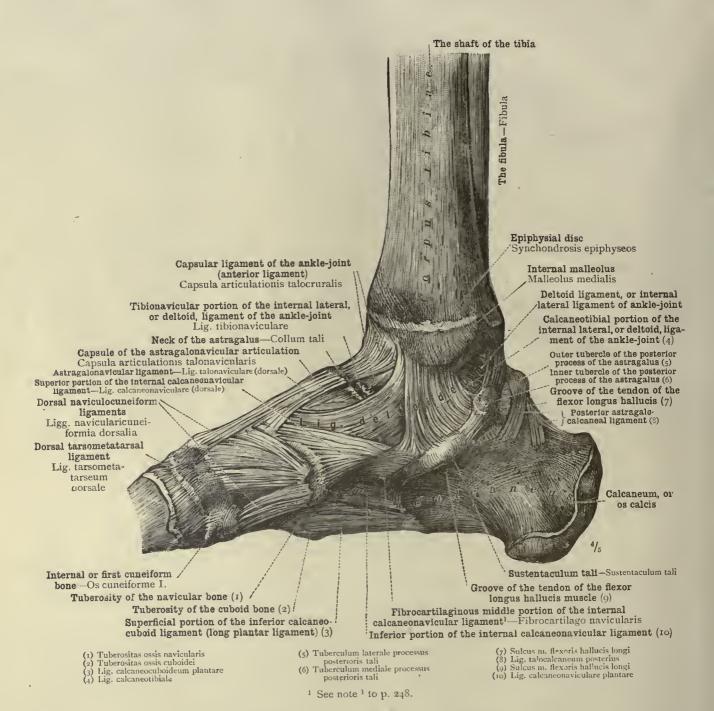


Fig. 481.—The Superficial Internal Ligaments of the Ankle-Joint and of the Astragalocalcaneal Articulation, and the Relation of the Distal Epiphysial Disc of the Tibia to the Ankle-Joint. (The Right Tarsus, with the Adjoining Portions of the Tibia and Fibula and of the First Metatarsal Bone; seen from the Inner Side.)

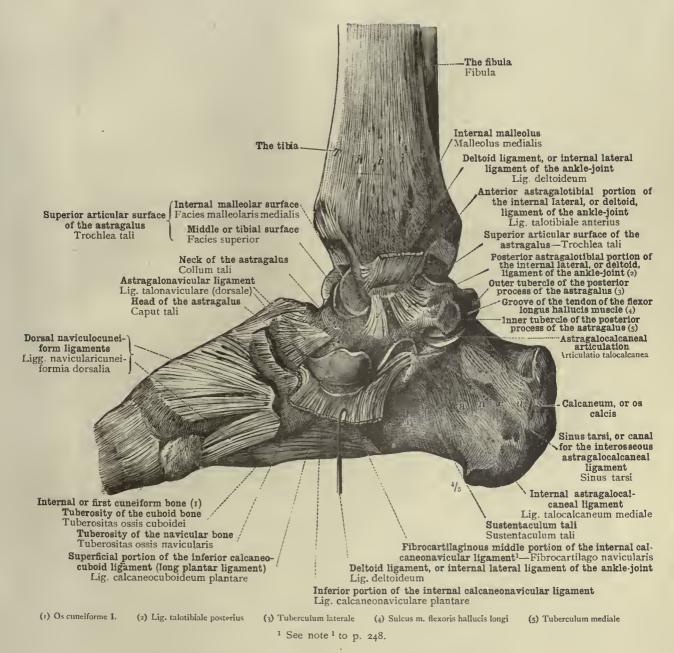


Fig. 482.—The Deep Internal Ligaments of the Ankle-Joint and of the Astragalocalcaneal Articulation. (The Right Tarsus, with the Adjoining Portions of the Tibia and Fibula and of the First Metatarsal Bone; seen from the Inner Side.)

The deltoid ligament (internal lateral ligament of the ankle-joint) has been cut across the middle, and the divided ends have been turned up and down. The capsular ligaments of the ankle-joint and of the astragalocalcaneal articulation have been removed, except for the deeper special bands.



(1) Lig. talofibulare anterius (2) Lig. calcaneofibulare

(3) Os cuneiforme III. (4) Lig. talonaviculare (dorsale)

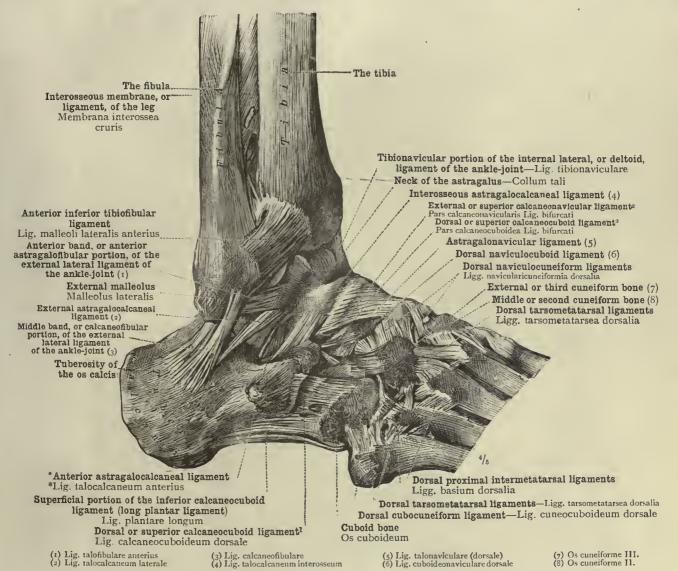
(5) Lig. cuboideonaviculare dors(6) Lig. intercuneiforme dorsale

(7) Os cuneiforme II.

Fig. 483.—Articulatio Talocruralis, the Ankle-Joint; Syndesmosis Tibiofibularis, the INFERIOR TIBIOFIBULAR ARTICULATION. THE RELATIONS OF THE DISTAL EPIPHYSIAL DISCS OF THE TIBIA AND FIBULA TO THE ANKLE-JOINT. ARTICULATIONES INTERTARSEÆ ET TARSO-METATARSEÆ, THE INTERTARSAL AND TARSOMETATARSAL ARTICULATIONS; ARTICULATIONES Intermetatarseæ, the Intermetatarsal Articulations. Ligamenta Tarsi Dorsalia ET TARSOMETATARSEA DORSALIA ET LIGAMENTA BASIUM DORSALIA; THE DORSAL LIGAMENTS OF THE TARSUS, THE DORSAL TARSOMETATARSAL LIGAMENTS, AND THE DORSAL PROXIMAL INTERMETATARSAL LIGAMENTS. (THE RIGHT TARSUS WITH THE ADJOINING PORTIONS OF THE TIBIA AND FIBULA AND OF THE METATARSUS; DORSO-EXTERNAL ASPECT.)

The joints are unopened except for the astragalocal aneal, astragalonavicular, and naviculocuneiform articulations, which have been partly opened.

Articulationes pedis-The articulations of the foot.



The strongest part of this ligament is situate external, and not superior, to the calcaneocuboid articulation; it would therefore be more appropriately named the external calcaneocuboid ligament.—Tr.

In the English nomenclature these are regarded as two distinct ligaments, not, as by Toldt, as two parts of a single ligament.—Tr.

Fig. 484.—Articulationes Talocruralis et Talocalcanea, the Ankle-Joint and the Astragalocalcaneal Articulation; Ligamentum Malleoli Lateralis Anterius, Anterior Inferior Tibiofibular Ligament. The Anterior and Middle Bands of the External Lateral Ligament of the Ankle-Joint (Ligamentum Talofibulare Anterius et Ligamentum Calcaneofibulare): Ligamenta Talocalcanea, Laterale. \*Anterius, et Interosseum: the External, \*Anterior, and Interosseous Astragalocalcaneal Ligaments.—Articulationes Intertarseæ et Tarsometatarseæ, the Intertarsal and Tarsometatarsal Articulations; Articulationes Intermetatarseæ, the Intermetatarsal Articulations: Ligamenta Tarsi Dorsalia, Ligamenta Tarsometatarseæ Dorsalia, et Ligamenta Basium Dorsalia, the Deeper Dorsal Tarsal and Tarsometatarsal Ligaments, and the Dorsal Proximal Intermetatarsal Ligaments. (The Right Tarsus, with the Adjoining Portions of the Tibia and Fibula and of the Metatarsal Bones; Dorso-external Aspect.)

The anterior ligament of the ankle-joint and the lateral portion of the capsule of the astragalocalcaneal articulation have been removed.

Articulationes pedis—The articulations of the foot.



Fibrous or sesamoid plate (Quain), or glenoid plate (Macalister) -TR.

Fig. 485.—The Superficial Ligaments of the Plantar Surface of the Right Foot and the Relations of the Tendons of the Tibialis Anticus and Posticus and of the Peroneus Longus Muscles to these Ligaments. Ligamenta Tarsi et Tarsometatarseæ, the Tarsal and the Tarsometatarsal Ligaments: Ligamenta Basium Plantaria, Ligamenta Capitulorum Transversa, et Ligamenta Accessoria Plantaria; the Plantar Proximal Intermetatarsal Ligaments, the Transverse Metatarsal Ligament, and the Inferior Metatarsophalangeal Ligaments (see note above); the Relations of these Ligaments to the Digital Processes of the Plantar Fascia.

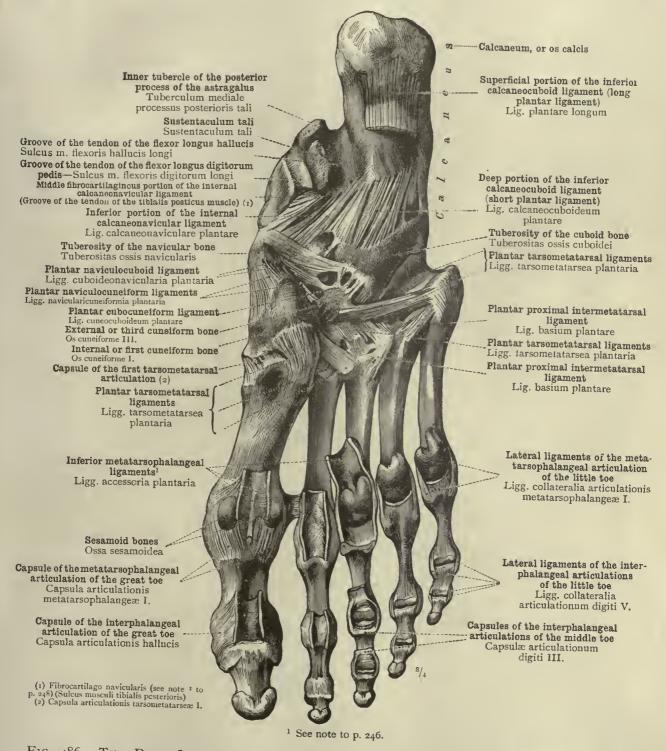
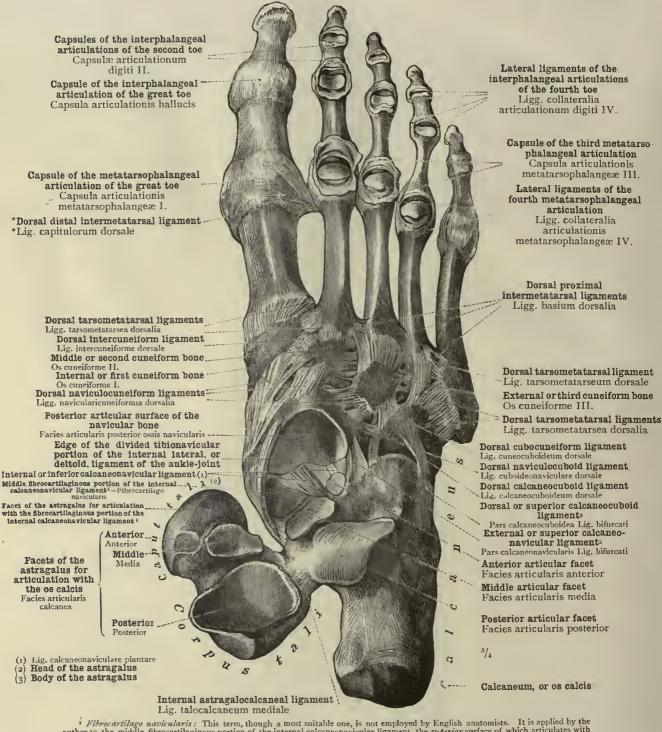


Fig. 485.—The Deep Ligaments of the Sole of the Foot and the Sesamoid Bones of the Metatarsophalangeal Articulation of the Great Toe.

In the preparation shown in Fig. 485 the tendons of the muscles were removed, also the long plantar ligament except for its posterior extremity, and the transverse metatarsal ligament and the digital processes of the plantar fascia were cut away. Some of the metatarsophalangeal and interphalangeal articulations have been opened; others have been left intact.

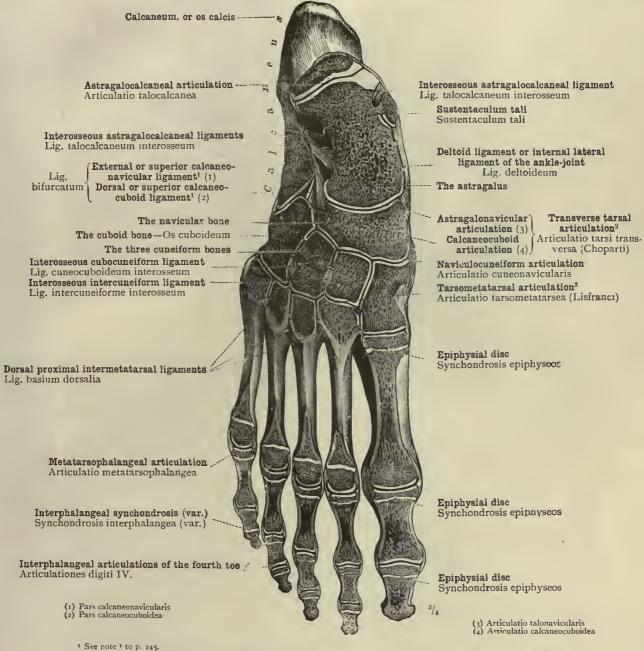


i Fibrocartilago navicularis: This term, though a most suitable one, is not employed by English anatomists. It is applied by the author to the middle fibrocartilaginous portion of the internal calcaneonavicular ligament, the superior surface of which articulates with a special facet on the head of the astragalus, between the internal of the three facets for the os calcis (posteriorly) and the facet for the navicular bone (anteriorly). The internal articular facet of the os calcis, the facet on the superior surface of the fibrocartilago navicularis, and the posterior articular facet of the navicular hone, thus form a continuous articular surface for the head of the astragalus. The inferior surface of the cartilago navicularis, likewise cartilaginous in texture, forms, as shown in Fig. 487, the groove for the tendon of the tibialis posticus muscle.—Tr.

2 See note 1 to p. 245.

FIG. 487.—THE ARTICULAR SURFACES OF THE ASTRAGALOCALCANEONAVICULAR ARTICULATION, THE DEEP LIGAMENTS OF THE DORSUM OF THE FOOT, THE METATARSOPHALANGEAL AND INTERPHALANGEAL ARTICULATIONS OF THE TOES. (THE RIGHT FOOT SEEN FROM THE DORSAL SIDE.)

The capsule of the astragalocalcaneal articulation was removed, with the exception of the internal astragalocalcaneal ligament; the capsule of the astragalonavicular articulation was also removed with the exception of its internal and plantar walls; and, after removing the interosseous astragalocalcaneal ligament, the astragalus was rotated inwards (on the internal astragalocalcaneal ligament as a hinge), until its inferior surface looked directly upwards.



<sup>1</sup> See note <sup>1</sup> to p. 245.
<sup>2</sup> Known also as the *mediotarsal* or *mid-tarsal* joint. It is through this joint (the two parts of which are, however, entirely separate articulations) that the foot is divided in Chopart's amputation.
<sup>3</sup> It is through the tarsometatarsal articulations that the foot is divided in Lisfranc's amputation.

FIG. 488.—ARTICULATIONES INTERTARSEÆ ET TARSOMETATARSEÆ, THE INTERTARSAL AND TARSOMETATARSAL ARTICULATIONS, SHOWING CHOPART'S (MEDIOTARSAL) LINE, AND LISFRANC'S OR HEY'S TARSOMETATARSAL LINE: LIGAMENTA TARSI INTEROSSEA ET LIGAMENTA CUNEOMETATARSEA INTEROSSEA, THE INTEROSSEOUS LIGAMENTS OF THE TARSUS, AND THE INTEROSSEOUS METATARSOCUNEIFORM LIGAMENTS. ARTICULATIONES INTERMETATARSEÆ, THE INTERMETATARSAL ARTICULATIONS. ARTICULATIONES METATARSOPHALANGEÆ, THE METATARSOPHALANGEAL ARTICULATIONS. ARTICULATIONES DIGITORUM PEDIS, THE INTERPHALANGEAL ARTICULATIONS OF THE TOES. THE RELATIONS OF THE EPIPHYSIAL DISCS OF THE METATARSAL BONES AND OF THE PHALANGES OF THE TOES TO THE RESPECTIVE ARTICULATIONS. (HORIZONTAL SECTION THROUGH THE ARTICULATIONS OF THE RIGHT FOOT OF A YOUTH AGED SEVENTEEN YEARS. SUPERIOR SURFACE OF THE LOWER SEGMENT.)



Fig. 489.—The Articulations of the Right Foot of a Youth aged Seventeen Years, seen in Sagittal Section, and showing the Relations of these Articulations to the Epiphysial Discs.

The section passes through the distal extremity of the tibia, the astragalus, the os calcis, the middle cuneiform bone, the second metatarsal bone, and the phalanges of the second toe.

## INDEX

## TO THE ARTHROLOGY

Certain names in this Index have an asterisk (\*) prefixed; these, as more fully explained in the Translator's Preface, being terms that form part of the English nomenclature used in this work, but which are not commonly employed by English anatomists. To other names a dagger (†) is prefixed; these are Latin names used by the author in the original work, but not included in the official nomenclature of the "Anatomische Gesellschaft."

```
ACETABULUM, the, 225, 227 transverse ligament of the, 168, 223, 225, 227
†Amphiarthroses intercarpeæ, 169
 Amphiarthrosis, 169
 Ankle-joint, the, 239, 241, 243, 245
Annulus fibrosus (fibrocartilaginis intervertebralis), 173, 174
Aponeurosis (see also "Fascia"):
                   intercostal, anterior or external, 186
posterior or internal, 176, 183, 184,
                                         187
                   lumbar, see "Fascia, lumbar"
Arthrodia, 168
Articularis, 246
Articular facet of the clavicle, sternal, 198
surface of the carpus, radial, 213
Articulatio vel articulationes:
                acromioclavicularis, 201, 202
                atlanto-epistrophica, 190-192
                atlanto-occipitalis, 167, 190-193
                calcaneocuboidea, 249
                capitulorum (costarum), 182-184, 185
                carpometacarpea, 167, 212-215

pollicis, 167, 212-214
                cochlearis, 166
                composita, 169
                costotransversariæ, 182
                costovertebrales, 182-184
                coxæ, 168, 222-227
                cubiti, 169, 204-208
cuneonavicularis, 244, 249
digitorum (manus), 166, 210, 211, 214, 215
                pedis, 249, 250
ellipsoidea, 167
                et ligamenta capitis, 190-196
                                    cinguli extremitatis inferioris, 216-
                                    cinguli extremitatis superioris,
                                         198, 199
                genu, 228-237
                hallucis, 246-248
humeri, 168, 200-203
                humeroradialis, 169
                humero ulnaris, 208
                intercarpea, 169, 212-215
interchondrales, 186, 188
                intermetacarpeæ, 169, 212-214
intermetatarseæ, 244, 245, 249
                intertarseæ, 244, 245, 249
intervertebrales, 173-175, 185
                mandibularis, 194-196
                manus, 169, 210-214
                metacarpophalangeæ, 166, 167, 210, 211, 214, 215
                metacarpophalangea pollicis, 210, 214
metatarsophalangeæ, 249, 250
               pedis, 239, 250
pollicis, 210, 211, 214
radiocarpea, 169, 212-215
                radio-ulnaris distalis, 209-214
                                  proximalis, 169, 209
```

```
Articulatio vel articulationes:
                sacro-iliaca, 216, 217, 219
sellaris, 167, 169
                 simplex, 166-168
                 sphæroidea, 168
                 sternoclavicularis, 170, 185-187, 198
sternocostales, 186-188
                talocalcanea, 239, 241, 244, 245, 249, 250 talocalcaneonavicularis, 250; articular surfaces
                       of, 248
                 talocruralis, 239, 241, 243-245
                talonavicularis, 244, 249
tarsi transversa (Choparti), 249
                tarsometatarseæ, 244, 245, 249, 250 tibiofibularis, 228, 229, 231, 233, 238
                trochoidea, 169
Articulation or articulations (see also "Joint"):
                   acromio-clavicular, 201, 202
and ligaments of the head, 190-196
                                         of the pelvic girdle, 216-219
of the shoulder-girdle, 195-199
                   astragalocalcaneal, 239, 241, 244, 245, 249, 250
                   astragalocalcaneonavicular, 250; articular sur-
                         faces of, 248
                   astragalonavicular, 244, 249
                  atlanto-axial, 190-192 calcaneocuboid, 249
                  carpal, transverse, 169, 212-215
carpometacarpal, 167, 212-215
of the thumb, 116, 212-214
                  chondrosternal, 186-188
                  continuous, 164, 165
costocentral, 182-185
                  costotransverse, 182
discontinuous, 166-169
                  of the fingers, 166, 210, 211, 214, 215
                  of the foot, 239, 250
                   of the great toe, 246.248
                  of the hand, 169, 210-214
of the hip, 168, 222-227
humeroradial, 169
                  humero-ulnar, 208
                  intercarpal, 169, 212-215
interchondral, 186, 188
                  intermetacarpal, 169, 212-114
                  intermetatarsal, 244, 245, 249
interphalangeal, of the fingers, 166, 210, 211,
                                             214, 215
of the thumb, 210, 211, 214
                                            of the toes, 249, 250
                  intertarsal, 244, 245, 249
                  intervertebral, 173-175, 185
                 of the knee, 228-237
of the lower extremity, 216-250
mediotarsal (Chopart's), 249
metacarpophalangeal, 166, 167, 210, 211, 214,
215
of the thumb, 210, 214
                  of the knee, 228-237
                  metatarsophalangeal, 249, 250
                  naviculocuneiform, 244, 249
                  occipito-atlantal, 167, 190-193
```

pisipyramidal, 212

| Auticulation on auticulations:  | Capsula vel capsulæ:  |
|---|---|
| Articulation or articulations: radiocarpal, 169, 212-215                  | articulationis humeri, 199, 200, 203  |
| radio-ulnar, distal, 209-214  | pars fibrosa, 201   |
| proximal, 169, 209  | synovialis, 201, 203  |
| sacrococcygeal, 180, 216, 217   | mandibularis, 194, 196  |
| sacro-iliac, 216, 217, 219  | manus, 214  |
| of the shoulder, 168, 200-203   | ossis pisiformis, 212   |
| sternoclavicular, 170, 185-187, 198                                       | radiocarpeæ, 213  |
| tarsometatarsal, 244, 245, 249, 250                                       | radio-ulnaris distalis, 209-212   |
| temporomandibular, 194-196  | sternoclavicularis, 198   |
| temporomaxillary, 194-198   | talocalcaneæ, 239-241   |
| of the thumb, 210, 211, 214   | talocruralis, 240-242   |
| tibiofibular, inferior, 238-241, 244, 245                                 | pars fibrosa, 250<br>talonavicularis, 242   |
| superior, 228, 229, 231, 233, 238   | articulationum digitorum (manus), 166, 210, 211                                     |
| of the trunk, 171-187<br>of the upper extremity, 198-215                  | pedis, 246-248  |
| of the apper extremity, 190-215   | intervertebralium, 173, 175, 181, 184,  |
|   | 185   |
| - B.  | metacarpophalangearum, 166, 167,  |
| *   | 210, 211  |
| Bicipital groove, synovial sheath of the, 201, 202                        | metatarsophalangearum, 247, 248   |
| Bigelow, Y ligament of, 222, 224, 226, 227                                | tarsometatarsearum, 247   |
| Bones, sesamoid, of the foot, 246, 247, 250<br>of the hand, 210, 211, 214 | Capsule or capsules (see also "Ligament, capsular"):                                |
| of the knee, 232, and note, p. 211  | of the acromicclavicular joint, 201   |
| Bursa beneath the internal lateral ligament of the knee-                  | of the articulations of the great toe, 246-248                                      |
| joint, 236  | of the astragalonavicular articulation, 242   |
| beneath the patellar ligament, 231  | atlanto-axial, 181, 190 of the carpometacarpal joint of the thumb, 210-213          |
| beneath the suprapatellar tendon, 228, 230, 231, 234,                     | of the costocentral articulations, 185  |
| 235   | of the costotransverse articulations, 185   |
| between the tendon of the semimembranosus muscle                          | of the hip-joint, fibrous portion, 168  |
| and the knee-joint, 232   | synovial portion, 168   |
| between the tendon of the semimembranosus muscle                          | of the interphalangeal articulations of the fingers,                                |
| and the tendon of the inner head of the gastroc-                          | 166, 210, 211   |
| nemius muscle, 232  | of the interphalangeal articulations of the toes                                    |
| of the odontoid process, 192  | 246-248   |
| of the subscapularis muscle, 202, 203                                     | of the inferior radio-ulnar articulation, 209-212                                   |
| subacromial, 202, 203   | of the joints of the articular processes of the verte-                              |
| subdeltoid, 202, 203  | bræ, 173, 175, 181, 184, 185<br>of the metacarpophalangeal articulations, 166, 167, |
| of the tendon of the popliteus muscle, 232, 233, 235,                     | 210, '211   |
| 237   | of the metatarsophalangeal articulations, 247, 248                                  |
| Bursa apicis dentis (epistrophei), 192                                    | occipito-atlantal, 167, 181, 190, 193   |
| isiopectinea, 227   | of the pisipyramidal articulation, 212  |
| infrapatellaris profunda, 231   | of the radiocarpal articulation, 213  |
| ligamenti collateralis tibialis, 236                                      | of the sternoclavicular joint, 198  |
| musculi gastrocnemii medialis, 232  | of the tarsometatarsal articulations, 247   |
| poplitei, 232, 233, 235, 237<br>semimembranosi, 232                       | of the transverse carpal articulation, 214  |
| subscapularis, 202, 203   | of the wrist-joint, 213   |
| subdeltoidea, 202, 203  | Cartilage, articular, 168   |
| suprapatellaris, 228, 230, 231, 234, 235                                  | hyaline, of the vertebral bodies, 174<br>Cartilago articularis, 168                 |
| 7 1 1 7 7 0 7 0 7 0 7 0 7   | Cavitas glenoidalis scapulæ, 201, 203   |
|   | Cavity, sigmoid, of the radius, 212   |
| <b>C</b> .  | great, of the ulna, 208, 209  |
| Canal of the carpus, 211, 213   | synovial, 170   |
| neural, 177   | Cavum articulare, 170   |
| obturator, 217, 222, 224, 226   | Chorda obliqua, 209   |
| Canalis carpi, 211, 213   | Communication between the radiocarpal and the pisipyra                              |
| obturatorius, 217, 222, 224, 226  | midal articulation, 212, 213  |
| vertebralis, 177  | Communication between the wrist-joint and the pisipyra                              |
| Capsula vel capsulæ:  | niidal articulation, 212, 213<br>Condylarthrosis, 167                               |
| articularis, 166-168, 170   | Condyles of the femur, 237  |
| pars fibrosa, 168   | Condyli femoris, 237  |
| synovialis, 168<br>articulationis acromioclavicularis, 201                | Continuous articulation, 164, 165   |
| atlanto-epistrophicæ, 181, 190  | Cooper's ligament, 221, 224   |
| atlanto-occipitalis, 167, 181, 190, 193                                   | Cotyloid noteli, 223-225  |
| capituli, 185   |   |
| carpometacarpeæ pollicis, 210-213   | D.  |
| costotransversariæ, 185   | Diarthrosis, 166-169  |
| coxæ, 168, 222, 223, 226, 227   | Discontinuous articulation, 166-169   |
| pars fibrosa, 224   | Disc or discs, epiphysial:  |
| synovialis, 224   | of the femur, distal, 230   |
| cubiti, 204-207   | proximal, 223   |
| pars fibrosa, 208   | of the fibula, distal, 239, 240, 244<br>proximal, 231                               |
| synovialis, 208<br>genu, 228, 230-233, 236, 237                           | of the humerus, proximal, 201   |
| pars synovialis, 234, 235   | of the metatarsal bones, 249, 250   |
| hallucis, 246-248   | of the os calcis, 240   |
|   |   |

| Disc or discs, epiphysial: of the phalanges of the fingers, 215                                | Foramen, sacrosciatic, great, 176, 216-218 small, 176, 216-218                      |
|--|---|
| of the middle finger, 215  | Fossa, glenoid, of the scapula, 201, 203  |
| of the toes, 249<br>of the radius, distal, 215   | of the interarticular ligament, 223 Fovea articularis superior (atlantis), 167, 190 |
| of the third metacarpal bone (distal extremity), 215   | capitis femoris, 223  |
| of the tibia, distal, 239, 240, 242, 244, 250  | dentis, 190   |
| proximal, 230, 231   | Foveæ costales (corporum vertebrarum), 183  |
| Disc, interpubic, 217, 220, 221  | transversales, 175, 178, 185  |
| Discs, intervertebral, 172-174, 177, 178, 182, 183, 185<br>of the sacrococcygeal articulation, |   |
| 216, 217, 180  | G.  |
| Discus articularis, 170  | Ginglymus, cochleoid, 166   |
| articulationis acromioclavicularis, 201  | screw, 166  |
| mandibularis, 196  | Gliding joints, 169   |
| radio-ulnaris distalis, 212-214<br>sternoclavicularis, 160, 188, 198                           | Intercarpal, 169  |
| Dura mater encephali, 165, 190, 192  | Gomphosis, 165 *Groove, preauricular, 216   |
| spinalis, 179  | productional, are   |
|  | н.  |
| E.   | Harmonia, 164   |
| Elbow-joint, 169, 204-208  | Hip-joint, 168, 222-227   |
| Enarthrosis, 168   | 1.  |
| F.   |   |
| ••   | Incisura clavicularis (sterni), 198   |
| Facies articularis acromii, 201  | scapulæ, 199, 200<br>semilunaris (ulnæ), 208, 209                                   |
| calcanea (tali) anterior, 248  | uluaris (radii), 212  |
| niedia, 248<br>posterior, 248  | Interlacing tendons in front of the pubic symphysis, se                             |
| (calcanei) auterior, 248   | "Ligament, pubic, anterior"   |
| media, 248   | Interpuble disc, 217, 220, 221  |
| posterior, 248   | Intervertebral discs, see "Discs, intervertebral"                                   |
| capituli costæ, 182  |   |
| carpea (radii), 213<br>(dentis epistrophei) anterior, 192                                      | J,  |
| posterior, 192   | Joint or joints, see also "Articulation":   |
| fossæ mandibularis, 196  | ball-and-socket, 168  |
| patellæ, 229, 234, 235   | compound, 169   |
| posterior (ossis navicularis pedis), 248   | condyloid, 167  |
| sternalis (claviculæ), 198   | elbow, 169, 204-208   |
| auricularis (ossis ilium), 219<br>lunata (acetabuli), 168, 224, 225, 227                       | hinge, 166, 169<br>knee, 228-237  |
| patellaris (femoris), 229, 234, 237  | mediotarsal, 249  |
| Falciform process of the great sacrosciatic ligament, 217                                      | pivot, 169  |
| Falx inguinalis, 220   | saddle, 167, 169  |
| †Fascia lumbalis, 176  | simple, 166-168   |
| lumbar, 176, 216, 218<br>lumbodorsalis, 176, 218   | trochoid, 169<br>Juncturæ ossium extremitatis inferioris, 216-250                   |
| obturator, 221   | superioris, 198-215   |
| perineal, deep, 220, 221, and note, p. 221   | trunci, 171-187   |
| plantar, 246   |   |
| triangular, 220  | К.  |
| Fibrocartilage, interarticular, 170 of the acromioclavicular                                   | Knee-joint, 228-237   |
| joint, 201   |   |
| of the inferior radio-ulnar  | L.  |
| articulation, 212-214  | Labrum glenoidale, 168<br>articulationis coxæ, 223-225, 227                         |
| of the sternoclavicular joint,<br>170, 188, 198  | humeri, 201, 203  |
| of the temporomandibular   | Lamina fibrocartilaginea interpubica, 217, 220, 221                                 |
| articulation, 196  | Ligament or ligaments:  |
| triangular, 212-214  | acroniioclavicular, superior, 199, 201  |
| Fibrocartilages, semilunar, 229, 233, 235-237  | alar, 234, 235<br>of the ankle-joint:   |
| posterior or ascending band of<br>the external, 233, 235-237                                   | anterior, 242, 244, 250   |
| transverse ligament of the, 229,   | astragalofibular, auterior, 244, 245  |
| 237  | posterior, 239, 241   |
| Fibrocartilaginous middle portion of the internal calcaneo-                                    | astragalonavicular, 242-245   |
| navicular ligament, 242, 243, 247, 248, and note, p. 248                                       | astragalotibial, anterior, 243  |
| Fibrocartilago basalis, 196 Fibrocartilagines intervertebrales, 172-174, 177, 178, 182,        | posterior, 240, 241, 243<br>calcaneofibular, 239-241, 244, 245                      |
| 183, 185   | calcaneotibial, 239-241, 244, 245   |
| Fibrocartilago navicularis, 242, 243, 247, 248, and note,                                      | capsular, 240, 242, 250   |
| p. 248   | deltoid, 239-245, 248, 249  |
| Filum terminale, 179 Fiscure of the interpublic disc. 220                                      | lateral, external, 239-241, 244, 245  |
| Fissure of the interpubic disc, 220 Fold of the synovial membrane of the wrist-joint, 213      | internal, 239-245, 248, 249<br>posterior, 240                                       |
| Foramen ischiadicum majus, 176, 216-218  | tibionavicular, 242, 244, 245, 248  |
| minus, 176, 216-218  | annular, of radius, 169, 204, 205, 207-209  |

254 INDEX

| The same of the sa |   |   |
|--|---|---|
| Ligament   | or ligaments: astragalocalcaneal, *anterior, 244, 245, 250                | Ligament or ligaments: of the hip-joint:                                      |
|  | capsular, 239-241   | Y, of Bigelow, 222, 224, 226, 227   |
|  | external, 245   | zona orbicularis, 223, 224, 226, 227  |
|  | internal, 243, 248  | iliofemoral, 222, 224, 226, 227   |
|  | interosseous, 239, 244, 245,  | iliolumbar, 176, 216, 218, 224  |
|  | 249, 250  | interarticular, of the hip-joint, 169, 223-225, 227                           |
|  | posterior, 240, 242<br>of the atlas, cruciform, 191, 192                  | interclavicular, 157, 158, 198<br>intercuneiform, dorsal, 244, 248            |
|  | transverse, 190-192   | interosseous, 249   |
|  | of the base of the skull, 196   | intermetacarpal, distal, anterior, 211  |
|  | of Bigelow, 222, 224, 226, 227  | palmar, 211   |
|  | calcaneocuboid, dorsal, 244, 245, 248                                     | proximal, anterior, 211, 212  |
|  | inferior, 242, 243, 245-247, 250  | dorsal, 210, 213  |
|  | plantar, 242, 243, 245-247, 250   | interosseous, 214<br>palmar, 211, 212   |
|  | superior, 244, 245, 248 calcaneonavicular, internal:                      | posterior, 210, 213   |
|  | inferior portion, 242, 243, 246, 248                                      | intermetatarsal, distal, dorsal, 248  |
|  | middle portion, 242, 243, 247, 248, and                                   | vlantar, 246  |
| -  | note p. 248   | proximal, dorsal, 244, 245, 248,  |
|  | superior portion, 242   | 249   |
|  | capsular, 166-168, 170 (see also "Capsule or cap-                         | plantar, 246, 247<br>interosseous, of the forearm, 209                        |
|  | sules'') of the elbow-joint, 204-208                                      | of the leg, 228, 229, 231-235, 238-241  |
|  | of the hip-joint, fibrous portion, 224                                    | interspinous, 163, 174, 177, 181  |
|  | synovial portion, 224   | intertransverse, 184  |
|  | of the shoulder-joint, 199, 200, 203                                      | ischiocapsular, 222, 226, 227   |
|  | of the temporomandibular articulation,                                    | of the knee-joint, 228-237  |
|  | 194, 196  | alar, 234, 235  |
|  | of the temporomaxillary articulation,                                     | capsular, 228, 230-233, 236, 237<br>crucial, anterior or external 229, 233,   |
|  | of the carpus, annular, anterior, 211-213                                 | crucial, anterior or external 229, 233, 235-237                               |
|  | palmar, 212   | internal or posterior, 229, 233,  |
|  | radiate, 212  | 235-237   |
|  | carpometacarpal, 210-214  | lateral, external, 228, 229, 231-235  |
|  | anterior, 211, 212  | posterior, 231, 232   |
|  | dorsal, 210, 213  | arcuate portion   |
|  | interosseous, 214   | of the, 232<br>direct portion of  |
|  | palmar, 211, 212<br>posterior, 210, 213                                   | tlie, 231, 232  |
|  | central, of the spinal cord, 179  | short, 231, 232   |
|  | coccygeal, lateral, 179, 180  | internal, 228-230, 232, 233, 235, 236   |
|  | conoid, 199, 202  | mucous, 234, 235  |
|  | Cooper's, 221, 224  | patellar, 228-231, 236  |
|  | coraco-acromial, 170, 199, 200, 202                                       | lateral, external, 228, 231   |
|  | coracoclavicular, 199, 202<br>coracolumieral, 199, 200                    | internal, 228, 230  |
|  | coracoscapular, 170, 199, 200, 202  | posterior, 232, 235   |
|  | costoclavicular, 186, 188, 198  | semilunar fibrocartilages :<br>external, 229, 233, 235-237                    |
|  | costocentral, anterior, 176, 178, 182, 183                                | posterior or ascending  |
|  | interarticular, 182, 183, 185   | band of the, 233,   |
|  | stellate, 176, 178, 182, 183  | 235-237   |
|  | costotransverse, anterior superior, 176, 183<br>middle, 182               | internal, 229, 233, 235-237   |
|  | posterior, 182, 184, 185  | transverse ligament of the, 229,  |
|  | posterior superior, 184   | 237   |
|  | cotyloid, 223-225, 227  | Wrisberg's, 233, 235-237<br>lateral, of the finger-joints, 166, 210, 211, 214 |
|  | crucial, 229, 233, 235-237  | of the metacarpophalangeal articulation                                       |
|  | of the knee, 229, 233, 235-237  | of the thumb, 210   |
|  | cruciform, of the atlas, 191, 192<br>cubocuneiform, dorsal, 244, 245, 248 | of the metacarpophalangeal articulations,                                     |
|  | interosseous, 249, 250  | 166, 167, 210, 214  |
|  | plantar, 246, 247   | of the metatarsophalangeal articulations,                                     |
|  | of the elbow-joint, auterior, 204, 205                                    | 266-268   |
|  | capsular, 204-208   | of the toe-joints, 247, 248<br>metacarpal, transverse, 211                    |
|  | external lateral, 204, 205, 207   | metacarpophalangeal, anterior, 211, 215                                       |
|  | internal lateral, 204-206   | glenoid, 211, 215   |
|  | posterior, 206, 207<br>glenoid, 168                                       | palmar, 211, 215  |
|  | of the shoulder-joint, 201, 203   | metatarsal, transverse, 246   |
|  | of the hip-joint:   | metatarsocuneiform, interosseous, 249   |
|  | capsular, 168, 222, 223, 226, 227   | metatarsophalangeal, 246, 247   |
|  | cotyloid, 223-225, 227  | inferior, 250, and note, p. 246   |
|  | iliofemoral, 222, 224, 226, 227   | nucous, 234, 235<br>naviculocuboid, dorsal, 244, 245, 248                     |
|  | interarticular, 169, 223-225, 227   | plantar, 246, 247   |
|  | ischiocapsular, 222, 226, 227<br>pubofemoral, 222, 224, 226, 227          | naviculocuneiform, dorsal, 242-245, 248                                       |
|  | round, 169, 223-225, 227  | plantar, 247  |
|  | teres, 169, 223-225, 227  | oblique radio-uluar, 209  |
|  | transverse, of acetabulum, 168, 223, 225, 227                             | obturator, 117, 218, 222, 224, 226  |

| Ligament or ligaments:  | Ligament or ligaments:   |
|---|--|
| occipito-atlantal, anterior, 176, 181, 192, 193<br>posterior, 181, 192, 193   | of the vertebral column, anterior common, 173 174, 176, 178, 181-183   |
| occipito-axial, posterior or long, 177, 190-192                               | 216  |
| odontoid, alar, 191, 192  | posterior common, 173  |
| clieck, 191, 102<br>lateral, 191, 192   | of the wrist-joint, anterior, 211, 212                                 |
| middle, 191, 192  | annular, 211-213   |
| suspensory, 191, 192  | dorsal, 210  |
| orbicular, of the radius, 169, 204, 205, 207-209                              | lateral, external, 210, 213, 214                                       |
| patellar, 228-231, 236<br>lateral, external, 228, 231                         | internal, 210-212, 214<br>palmar, 211, 212                             |
| internal, 228, 231  | posterior, 210   |
| of the pelvis, transverse, 220, 221, and note,                                | Ligamentum vel ligamenta:  |
| p. 221  | accessoria plantaria, 246, 247, 250                                    |
| pisimetacarpal, 211, 212<br>pisi-uncinate, 211, 212                           | volaria, 211, 215<br>acrouioclaviculare, 199, 201                      |
| plantar, long, 242, 243, 245, 246, 247  | alaria, 191, 192   |
| short, 247, 250   | annulare radii, 169, 204, 205, 207-209                                 |
| pterygospinous, 195, 196<br>pubic, anterior, note, p. 220                     | apicis dentis, 191, 192<br>arcuatum pubis, 217, 218, 220, 221          |
| of Astley Cooper, 221, 224  | basium (ossium metacarpalium) dorsalia, 210                            |
| inferior, 217, 218, 220, 221  | 213  |
| posterior, note, p. 221   | (ossinm metacarpalium) interossea, 21                                  |
| subpubic, 217, 218, 220, 221<br>- superior, 220, 221                          | volaria, 121, 21:<br>(ossinn metatarsalium) dorsalia, 244              |
| pnbofemoral, 222, 224, 226, 227   | 245, 248, 249  |
| rhomboid, 186, 188, 198   | (ossium metatarsalium) plantaria, 246                                  |
| round, of the hip-joint, 169, 223-225, 227 sacrococcygeal, anterior, 180, 216 | hifurcatum and and and   |
| interarticular, 177, 179, 180   | bifurcatum, 245, 248, 249  † calcaneocuboideum dorsale, 244, 245, 248  |
| lateral, 177, 179, 180  | plantare, 242, 243, 246  |
| posterior, deep, 177, 179, 180  | 247, 250   |
| superficial, 180, 218<br>sacro-iliac, anterior, 216, 217, 219, 244            | calcaneofibulare, 239-241, 244, 245<br>calcaneonaviculare dorsale, 242 |
| interosseous, note, p. 218  | plantare, 242, 243, 246-248  |
| long, 218   | calcaneotibiale, 239-242   |
| oblique, 218<br>posterior, 218, 219   | capituli costæ interarticulare, 182, 183, 185                          |
| sacrosciatic, anterior, 176, 180, 216-219                                     | radiatum, 176, 178, 182, 183<br>fibulæ, 228, 229, 231, 234, 237, 238   |
| great, 176, 216-219   | capitulorum (ossium metacarpalium) trans                               |
| posterior, 176, 216, 219  | versa, 211   |
| small, 176, 180, 216-219<br>sphenomandibular, 195                             | † (ossium metatarsalium) dorsale<br>248                                |
| sphenomaxillary, 195  | trans  |
| of the spine, 172-181   | versa, 240   |
| rpinoglenoid, 200<br>sternoclavicular, 186, 187, 198                          | carpi radiatum, 212<br>transversum, 211-213                            |
| stylohyoid, 194, 195  | carponietacarpea dorsalia, 210, 213                                    |
| stylomandibular, 195  | interossea, 214  |
| stylomaxillary, 195<br>subflava, 173-175, 192                                 | † volaria, 211, 212<br>coccygenm laterale, 179, 180                    |
| supraseapular, 170, 199, 200, 202   | collaterale carpi radiale, 210, 213, 214                               |
| supraspinous, 173, 174, 177, 181, 184, 218                                    | ulnare, 210-212, 214   |
| tarsometatarsal, dorsal, 242, 244, 245, 248                                   | fibulare, 228, 229, 231-235  |
| interosseous, 249<br>plantar, 246, 247  | radiale, 204, 205, 207<br>tibiale, 228-230, 232, 233, 235, 236         |
| of the tarsus, dorsal, 244, 245   | ulnare, 204-206  |
| interosseous, 249   | collateralia articulationum digitorum (manus),                         |
| plantar, 246<br>temporomandibular, 194  | 166, 210, 211, 214<br>articulationum digitorum pedis                   |
| temporomaxillary, 194   | 247, 248   |
| tibiofibular, anterior inferior, 238, 244, 245                                | articulationis metacarpo   |
| superior, 228, 229, 231, 234,<br>237, 238                                     | phalangeæ pollicis, 210<br>articulationum metaearpophalau              |
| posterior inferior, 240, 241  | gearum, 166, 167, 210, 214   |
| transverse, of the acetabulum, 168, 223, 225,                                 | articulationum metatarsophalen   |
| of the other too too  | gearum, 246-248  |
| of the atlas, 190-192<br>of the transverse carpal articulation, 210-214       | colli costæ, 182<br>columnæ vertebralis, 172-181                       |
| anterior, 212   | conoideum, 199, 202  |
| dorsal, 210, 213  | coraco-acromiale, 170, 199, 200, 202                                   |
| interosseous, 213, 214<br>palmar, 212   | eoracoclaviculare, 202<br>eoracohumerale, 199, 200                     |
| posterior, 210, 213   | eostoelaviculare, 186, 188, 198  |
| trapezoid, 202  | costotransversarium anterius, 176, 183                                 |
| iriangular, of the urethra, 220, 221, and note,                               | posterius, 184   |
| p. 221<br>vaginal; of the toes, 246   | eostoxiphoidea, 186<br>cruciatum anterius, 229, 233, 235-237           |
| of the vertebral column, 172-181  | atlantis, 191, 192   |

256 INDEX

| Ligamentum z | vel ligamenta:   | Ligamentum vel ligamenta:   |
|--------------|--|---|
|              | ruciatum posterius, 229, 233, 235-237  | tarsouietatarsea plantaria, 246, 247  |
|              | cruciata (genu), 229, 233  | temporomandibulare, 194   |
|              | euboideonaviculare dorsale, 244, 245, 248  | teres femoris, 169, 223-225, 227  |
|              | plantare, 246, 247   | tibionaviculare, 242, 244, 245, 248   |
| c            | euneocuboideum dorsale, 244, 245, 248  | transversum acetabuli, 168, 223, 225, 227   |
|              | interosseum, 249, 250  | atlantis, 190-192   |
|              | plantare, 246, 247   | genu, 229, 237  |
|              | cuneometatarsea interossea, 249  | pelvis, 220, 221  |
| d            | leltoideum, 242, 243, 249  | scapulæ inferius, 200   |
|              | lava, 173-175, 192   | superius, 170, 199, 200   |
|              | liofemorale, 222, 224, 226, 227  | 202   |
|              | liolumbale, 176, 216, 218, 224   | trapezoideum, 202   |
| 1            | ntercarpea dorsalia, 210, 213  | tuberculi costæ, 182, 184, 185  |
|              | interossea, 213, 214   | vaginalia (digitorum pedis), 246  |
|              | volaria, 212   | Line, Chopart's, 249  |
|              | nterclaviculare, 187, 188, 198   | Hey's, 249  |
| 1            | ntercostalia externa, 186  | Lisfranc's, 249   |
| :            | interna, 176, 183, 184, 187  | mediotarsal, 249  |
| 11           | ntercuneiformia dorsalia, 244, 248   | M.  |
| :            | interossea, 249  | 125 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   |
|              | nterspinalia, 163, 174, 177, 181   | †Membrana atlanto-epistrophica, 192   |
|              | ntertransversaria, 184   | atlanto-occipitalis anterior, 176, 181, 192, 193                                    |
|              | schiocapsulare, 222, 226, 227  | posterior, 181, 192, 193  |
| 1            | ongitudinale anterius, 173, 174, 176, 178,   | interossea antibrachii, 209   |
|              | 181-183, 216   | cruris, 238   |
|              | posterius, 173, 174, 177, 179, 190,  | obturatoria, 117, 218, 222, 224, 226  |
| 1            | 192  | sterni, 186, 187  |
|              | umbocostale, 176, 216, 218   | tectoria, 177, 190-192  |
| 1            | nalleoli lateralis anterius, 238, 244, 245   | Membrane, intercostal, see "Aponeurosis"  |
|              | posterius, 240, 241  | interosseous, of the forearm, 209   |
| 1            | menisci lateralis (Roberti), 233, 235-237  | of the leg, 228, 229, 231-235, 238  |
| L            | navicularicuneiformia dorsalia, 242-245, 248<br>plantaria, 247                     | 241   |
| *            | iuchæ, 177, 181  | obturator, 117, 218, 222, 224, 226  |
|              | patellæ, 228-231, 236  | synovial, of the hip-joint, 223-225, 227; its reflect                               |
|              | pisohamatuni, 211, 212   | tion on the neck of the femur, 22   |
|              | pisometacarpeum, 211, 212  | of the knee-joint, 234, 235   |
|              | plantare longum, 245-247   | Meniscus lateralis, 229, 233, 235-237   |
|              | popliteum arcuatum, 232  | medialis, 229, 233, 235-237   |
| r            | obliquum, 232, 235   | Musculus articularis genu, 228, 230, 231, 235                                       |
| t            | oterygospinosum, 195, 196  |   |
|              | oubicum superius, 220, 221   | N.  |
|              | oubocapsulare, 222, 224, 226, 227  | Notely elevicular of the stamous 200  |
|              | adiocarpeum dorsale, 210   | Noteli, clavicular, of the sternum, 198   |
|              | volare, 211, 212   | cotyloid, 223-225   |
| S            | sacrococcygeum anterius, 180, 216  | suprascapular, 199, 200<br>Nucleus pulposus of the intervertebral discs, 173, 174   |
| `            | articulare, 177, 179, 180  | Nucleus purposus of the intervertebrar discs, 173, 174                              |
|              | laterale, 177, 179, 180  |   |
|              | posterius profundum, 177,  | Ο.  |
|              | 179, 180   | 01.4  |
|              | superficiale, 180,   | Obturator canal, 217, 222, 224, 226   |
|              | 181  | tascia, 221   |
| 5            | sacro-iliaca anteriora, 216, 217, 219, 224   | ligament, 117, 218, 222, 224, 226   |
|              | interossea, 218, 219   | membrane, 117, 218, 222, 224, 226   |
| S            | sacro-iliacum posterius breve, 219   | Ossa sesamoidea manus, 210, 211, 214  |
|              | longum, 218, 219   | pedis, 246, 247, 250<br>Os sesamoideum articulationis genu (var.), 232              |
|              | sacrospinosum, 176, 180, 216-219   | os sesamoneam articulationis genu (var.), 232                                       |
|              | sacrotuberosum, 176, 216-219   |   |
|              | phenomandibulare, 195  | P.  |
|              | sternoclaviculare, 186, 187, 198   | D-1-00-4-041-0  |
|              | sternocostale interarticulare, 188   | Pad of fat of the fossa acetabuli, 223  |
|              | sternocostalia radiata, 186  | Periosteum, dental, 165   |
|              | stylohyoideum, 194, 195  | Plate, fibrous, 246, 247, 250, and notes, pp. 211 and 246                           |
|              | stylomandibulare, 194-196  | glenoid, 246, 247, 250, and notes, pp. 211 and 246                                  |
| 5<br>t       | supraspinale, 173, 174, 177, 181, 184, 218<br>alocalcaneum anterius, 244, 245, 250 | sesamoid, 246, 247, 250, and notes, pp. 211 and 246                                 |
| ,            | interesseum 220°244 245 240  | Plicæ alares, 234, 235  |
|              | interosseum, 239, 244, 245, 249,   | Piica synovialis (articulationis radiocarpeæ), 213                                  |
|              | 250<br>laterale, 245   | patellaris, 234, 235<br>Pouch of synovial membrane, circular, of the proximal radio |
|              | mediale, 243, 248  | uluar articulation and act  |
|              | posterius, 240, 242  | ulnar articulation, 204, 20<br>and note, p. 204                                     |
| +            | alofibulare anterius, 244, 245   | vertical, of the distal radio   |
|              | posterius, 239, 241  | ulnar articulation, 214   |
| +            | alonaviculare (dorsale), 242-245   | Process, falciform, of the great sacrosciatic ligament, 217                         |
|              | arsi dorsalia. 244, 245  | Processus falciformis, 217  |
|              | interossea, 249  | Prominence of the pubic symphysis, posterior, 221                                   |
|              | plantaria, 246   | Promontorium, 177, 216, 217, 219  |
| t            | arsometatarsea dorsalia, 242, 244, 245, 248  | Promontory of the sacrum, 177, 216, 217, 219  |
|              | interossea, 249  | Pubic symphysis, 218, 220, 221  |
|              |  |   |

R

\*Recess, sacciform, of the distal radio-ulnar articulation, 214
of the proximal radio-ulnar articulation,
204, 207, and note, p. 204
Recessus sacciformis (articulationis radio-ulnaris distalis),
214
(articulationis radio-ulnaris proximalis), 204, 207
Retinaculum ligamenti arcuati, 231, 232
patellæ laterale, 228, 231
mediale, 228, 230

Sacral promontory, 117, 216, 217, 219 Sesamoid bones, see "Bones, sesamoid" of the foot, 246, 247, 250 of the hand, 210, 211, 214, and note, p. 211 Shoulder-joint, 168, 200-203 Substance, sutural, 164 Sulcus paraglenoidalis (præauricularis), 216 Surface, articular, of the acetabulum, 168, 224, 225, 227 of the acromion, 201 of the astragalus for the os calcis, anterior. of the astragalus for the os calcis, middle, 248 of the astragalus for the os calcis, posterior, 248 of the atlas, superior, 167, 190 of the centra for the ribs, 183 of the heads of the ribs, 182 of the navicular bone, posterior, 248 of the odontoid process, anterior, 192 of the os calcis, anterior, 248 middle, 248 posterior, 243 ot the patella, 229, 234, 235 of the transverse processes for the ribs, of the astragalus, superior articular:
external malleolar portion, 166 internal malleolar portion, 166, 243 tibial portion, 166, 241, 243 auricular, of the ilium, 219 patellar, of the femur, 229, 234, 237 Sutura, 164 serrata, 164 squamosa, 164 Sutural substance, 164 Suture, varieties of, 164 Symphysis, 165 ossium pubis, 218, 220, 221 sacrococcygea, 180, 216, 217 Synchondrosis, 164, 165 Synchondrosis, 165

of the base of the skull, 196

Synchondrosis vel synchondroses: epiphysial, see "Disc, epiphysial" epiphyseos capitis femoris, 223 humeri, 201 capituli ossis metacarpalis III., distalis femoris, 230 fibulæ, 239, 240, 244 radii, 215 tıbiæ, 239, 240, 242, 244, 250 proximalis fibulæ, 231 tibiæ, 230, 231 tuberis calcanei, 240 epiphysium ossium metatarsalium, 249, 250 phalangum digiti II. (manus), 215 digitorum pedis, 249 et ligamenta baseos cranii, 196 interphalangea pedis (var.), 249 petro-occipitalis, 193, 196 spheno-occipitalis, 165, 192, 196 sphenopetrosa, 196 sternalis, inferior, 188 superior, 188 Syndesmosis, 170 Syndesmosis, 170
tibiofibularis, 238-241, 244, 245
Synovial membrane of the shoulder-joint, 202, 203
sheath of the bicipital groove, 201, 202 of the tendon of the popliteus muscle, 232, 233, 235, 237; its communication with the knee-joint and the superior tibiofibular articulation, 233 T. Tendon of the long head of the biceps muscle, 201, 202,

Tendon of the long head of the biceps muscle, 201, 202, 203
†Torus pubicus, 221
Triangular fibrocartilage, 212-214
ligament of the urethra, 220, 221, and note, p. 221
Trochlea tali, 166, 239, 241
facies malleolaris lateralis, 166
unedialis, 166, 243
superior, 166, 241, 243
Trochlear surface of the astragalus, 166, 239, 241

## V.

Vagina mucosa intertubercularis, 201, 202

W.

Wrist-joint, 169, 212-215

Z.

Zona orbicularis, 223, 224, 226, 227





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